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Our Supplements

FOR some years past we have published regularly, at four-weekly intervals, two supplements, dealing respectively with diesel and electric railway traction. In these have been included not only technical articles concerning the engineering aspects of those two specialised branches of railway activity, but also operating articles and news information. The supplements are, of course, part of THE RAILWAY GAZETTE, and material contained in them is not repeated in the main body of the paper. Heretofore, therefore, the pages have been numbered continuously with the issue they have accompanied, so as to facilitate binding, indexing, and cross-referencing. It has been put to us from time to time, however, that as these supplements in themselves constitute a complete record of their industries, certain readers prefer to file them separately, and to meet such needs we have introduced a new system of pagination. From the beginning of the present year the *Electric Railway Traction Supplement* and the *Diesel Railway Traction Supplement* will each bear separate and continuous folios for periods of twelve months, and at the end of the calendar year separate indexes will be prepared. In addition, items in the supplements will be included in our ordinary half-yearly indexes, in which their folios will bear the prefixes D (diesel) and E (electric). Readers who prefer to continue to bind THE RAILWAY GAZETTE complete for the half year will probably elect to assemble the supplements in page order at the end of the volume.

London Transport Staff Interests

On a staff of 82,800, distributed in more than 1,100 separate grades, depends the smooth working of the road and rail service of the London Passenger Transport Board. The public and stockholders to whom the board's obligations are statutory expect the staff to be treated in the same fair manner. Anomalies in wages and conditions of employment resulting from taking over a staff of 75,500 employed by former independent companies, have nearly all been removed, and the wage-cuts imposed in the slump year of 1931 were gradually restored during the ensuing five years. Working conditions of Central bus drivers and conductors have been greatly eased. In addition the rates of pay of tram and trolleybus drivers and conductors were increased and consideration was paid to claims from the Country Bus staffs. The significant result may be judged by the fact that the average earnings of the 78,000 weekly paid staff have risen from £3 17s. 6d. in 1934 to the present figure of £4 2s. 9d.

* * * *

The Week's Traffics

Except for an increase of £7,000 in the passenger train receipts of the Great Western and no change in the coal earnings on the Southern the traffics of the four main line companies for the past week are generally down with a total decrease of £199,000, against one of £202,000 for the previous week. To the decrease for the week passengers contribute £11,000 net, merchandise £134,000, and coal £54,000. The three weeks of the present year show a combined decrease of £732,000 or 8·47 per cent. For the third week of 1938 there was an increase of £202,000.

	3rd Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	– 9,000	– 67,000	– 4,000	– 80,000	– 318,000	– 9·06
L.N.E.R. ..	– 6,000	– 42,000	– 33,000	– 81,000	– 278,000	– 10·75
G.W.R. ..	+ 7,000	– 20,000	– 17,000	– 30,000	– 109,000	– 7·39
S.R. ..	– 3,000	– 5,000	—	– 8,000	– 27,000	– 2·52

London Transport receipts for the past week were £576,000, an improvement of £16,100, making an aggregate advance of £189,400 for the 30 weeks of the current financial year with a total of £17,049,100. Mersey Railway traffics to date amount to £14,054, an increase of £120. The Belfast & County Down is £2 up on the year, and the Great Northern Railway (Ireland) for the same period shows an increase of £1,250 from goods and of £50 from passengers. For the past week the Great Southern records a passenger improvement of £410 and a goods improvement of £2,181.

* * * *

Nine Months' Freight Traffics

A comparison of the Ministry of Transport freight traffic statistics of British railways for the 40 weeks to October 1, 1938, with those for the 28 weeks to July 9, shows the rapid acceleration of the decreases during the third quarter of the year, following the decline in traffics which began to be prominent in March. For the 28 weeks to July 9 the decrease in the tonnage of all merchandise and minerals was 7·45 per cent., with a reduction in receipts of 3·62 per cent. At October 1 the decrease for the 40 weeks in all freight traffic units (including livestock) had become 10·35 per cent., with a drop in receipts of 5·99 per cent. Figures for the 12 weeks to October 1, 1938, show that during that period 10,172,249 tons of higher class merchandise were conveyed, a decrease of 1,983,548 tons or 16·32 per cent., producing receipts of £8,861,842, which were lower by £861,994 or 8·86 per cent. Of minerals and merchandise (classes 1-6) 9,223,885 tons were conveyed, a fall of no less than 4,445,337 tons

or 32·53 per cent., and the receipts of £2,478,505 dropped by £1,014,467 or 29·04 per cent. In the coal tonnage of 35,568,015 the decrease was 5,025,113 tons or 12·38 per cent., and the coal receipts of £6,963,483 fell £471,115 or 6·34 per cent. Receipts from all classes of freight traffic (including livestock) during the 12 weeks amounted to £18,584,189, a decrease of £2,381,321 or 11·36 per cent.

* * * *

Overseas Railway Traffics

The Great Western of Brazil and the Leopoldina Railways have secured in the first three weeks of 1939 increases of £5,100 and £13,463, respectively, accompanied by increases in currency. On the other hand, the San Paulo has a set-back of £2,356 for the first two weeks, with a decrease also in currency. Central Argentine traffics continue to improve, and the advance in the past fortnight has been £21,308 following one of £50,431 for the previous three weeks. At this time a year ago the company was showing heavy decreases. Buenos Ayres Great Southern receipts have gone back £59,925 during the two weeks, but at the end of the 30th week in 1936-37 its traffics were £202,525 up. On the Buenos Ayres Western the improvement in the past two weeks has been £9,119, and on the Buenos Ayres & Pacific it has been £11,042.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific ..	30th	106,576	+ 7,134	2,290,885	— 125,123
Buenos Ayres Great Southern ..	30th	186,476	— 29,715	3,893,424	— 118,610
Buenos Ayres Western	30th	52,543	+ 1,737	1,249,193	— 117,185
Central Argentine	30th	134,957	+ 14,206	3,236,117	— 551,192
Canadian Pacific ..	2nd	425,200	— 47,000	850,400	— 79,400
Bombay, Baroda & Central India	43rd	262,275	— 1,950	6,978,750	— 86,475

In the first two weeks of 1938 the Canadian Pacific secured an increase of £15,600.

* * * *

Siamese State Railways

A decided revival of prosperity is shown in the report on the Royal State Railways of Siam which we have recently received from the Director General. It covers the year Buddhist Era 2477 (April 1, 1934, to March 31, 1935). The length of line in operation remains at 3,100 km. on the metre gauge, of which 28 km. are double track. Work on the further duplication of 61 km. on the main line north of Bangkok was suspended in 1932, but good progress was made during 1934-35 on the North Eastern line extension of 93 km. from Khon Kaen to Kumpawapi, part of a larger scheme. £1 = 10·67 Baht.

	1933–34	1934–35
Passengers	3,259,442	4,510,856
Goods, tons	1,148,624	1,460,372
Operating ratio, per cent. ..	55·08	47·54
	Baht	Baht
Gross earnings	10,785,357	13,061,253
Expenditure	5,940,737	6,209,441
Net receipts	4,844,620	6,851,812

Goods tonnage during 1934-35 constituted a record. Coaching receipts (Baht 4,464,233) increased by 6·4 per cent., and goods receipts (Baht 7,779,570) by 31·6 per cent. in comparison with 1933-34. Diesel locomotives number 15, and diesel railcars 6. Net earnings, after provision for renewals, represent 2·93 per cent. on capital.

* * * *

First Class Travel

Some recently-published statistics relating to railway working in Argentina show that the proportion of first class travel in that country is exceptionally high, compared with other countries. The actual figures for the year 1937 were 41·8 per cent. first class and 58·2 per cent. second class (there is no third class in Argentina). Before the depression the proportion of first class was even higher, remaining about 45 per cent. for several years. In Great Britain, on the four main-line systems, and omitting season tickets, the number of first class journeys in 1937 represented only 1·39 per cent. of the total. Taking at random some other overseas railway systems, we find that on the South African Railways in 1937-38 the proportions were 28·97 per cent. first class, 26·77 per cent. second class, and 44·26 per cent. third. But in another country in the southern hemisphere, the South Australian Railways report over 99 per cent. of the passenger journeys accounted for by second class and workmen's tickets. An Indian railway reports 91·5 per cent. third class, which compares with the 92·83 per cent. second class of the Mexican Railway. What is denoted by the high proportion of first class travel in Argentina? Are the first class fares low in relation to income, or are the journeys shorter? Carriage comfort and the customs and habits of the people may have something to do with it.

* * * *

The Coal Export Decline

The position of the British coal industry in 1937, with an output of 240·41 million tons, was better than it had been for many years, and the quantity of coal disposed of commercially in the home market (164·03 million tons) was the highest ever reached. During 1938 there was some decline in output, but it is probable that the final figure will exceed that for 1936. The main weakness of the coal position is the enormous drop in the export figures. In 1913 our coal exports (including the coal equivalent of coke and manufactured fuel and coal for bunkers in ships engaged in the foreign trade) amounted to 98·34 million tons. In 1920 this figure had been reduced to 43·68, but had risen in 1929 to 82·15 million. By 1936 it had fallen to 50·34, but in 1937 there was a recovery to 56·30 million. For the first nine months of 1938 there was a reduction of about 4¼ million tons as compared with the corresponding period of 1937, according to the "Trade and Navigation Accounts of the United Kingdom." Since the war several Continental countries have greatly increased their own coal production, and have correspondingly discouraged imports. Comparing 1913 with 1937, we find that British coal exports (in millions of tons) to France have fallen from 12·7 to 8·8; to Germany from 8·9 to 3·2; to Italy from 9·6 to 2·2; and to Russia from 6·0 to nil.

* * * *

Recovering 3 Hours in 88 Miles

To recover all but three hours on schedule time in a journey no longer than 88 miles, even in these days of sensational happenings, is an event demanding more than a mere passing mention. As the schedule concerned was one of 6 hr. 51 min., it is obvious that here was no suggestion of spectacular speeds, though actually the speeds on this run were considerably more spectacular than the times suggest. The train was the Quetta Mail of the North Western Railway of India—No. 9 Up—and the 88 miles concerned embody an ascent of 5,440 ft. from Sibi up to Kolpur before the final drop of 375 ft. into Quetta. The train was one of eight bogie vehicles, and over the first stage, from Sibi to Abigum, with a ruling grade of 1 in 55, one of the efficient N.W.R. standard 2-8-0 engines of class "HG/S" worked it without help; then another engine of the same type came on as banker up the 8 miles at 1 in 33 to Mach, and finally a second 2-8-0 banker came on, as is customary, for the 1 in 25 ascent through the Bolan pass to Kolpur. Up the 1 in 25 the three engines forged ahead at 22 m.p.h., instead of the 8 m.p.h. required by the timetable, and by means of the remarkable average of 22½ m.p.h. throughout from Sibi to Quetta, including all stops

and this terrific climb, the Mail, which had left Sibi 2 hr. 52 min. late, was brought into Quetta five minutes early!

* * * *

Waterloo & City Tube Rejuvenation

If the present progress plans prove practicable of achievement, the Waterloo & City Railway rejuvenation will be completed during this year, and new five-car trains with a total capacity of 643 (222 seated and 421 standing) will make the journey in 4 min. as against the 40-year-old five-car trains holding 344 (260 seated and 84 standing) and taking 5 min. The first plans for extending railway communication between Waterloo and the City were authorised as long ago as 1846, but both this and subsequent attempts to build a surface line were deterred by the enormous cost of acquiring the necessary property. Eventually an independent company, formed under L.S.W.R. auspices, secured powers on July 27, 1893, for the present 1½-mile electrically-operated tube line, and this was opened on August 8, 1898. It was the second electric line in London, and the first to dispense with separate locomotives and have the motors on the train axles. To avoid passing under private property, the line was laid under public roads and crosses the River Thames diagonally, with the result that very sharp curves were adopted. The line was absorbed by the L.S.W.R. in 1907. Traffic has continued to increase, and the 380 daily trips of 1913 grew to 428 in 1921. The number of journeys was still 428 in the year 1937, but by lengthening the trains the total of cars daily had grown from 1,076 in the former to 1,316 in the latter period. Passengers carried in 1921 totalled 8,683,000, against 9,800,000 in 1937.

* * * *

An Automatic Interlocking in Germany

The large number of level crossings between two railways found in America has given occasion in recent years for the installation of automatic interlocking protection, eliminating the need of a signalman at points often remote from towns. In Europe such crossings are but seldom met with, and some interest thus attaches to the recent installation at a crossing between two German light railways, described on page 138 in this issue. The conditions are indeed relatively simple, and there is no automatic block protection to be combined with the crossing signalling; nevertheless, the adoption of the principle of automatic interlocking for the first time in Germany is worthy of note. It is interesting also to see that track-circuiting was not adopted, the controls being effected entirely through treadle rail contacts, as widely used in German signalling. The use of a separate emergency red lens unit in the colour-light signals is also in accordance with modern German practice and has the advantage of leaving no doubt in trainmen's minds which aspect is showing, the ordinary or the emergency.

* * * *

Passenger Locomotive Tenders

Until quite recently some of the most powerful passenger locomotives in this country were used to haul expresses —such as the Cheltenham Flyer and Silver Jubilee—which normally loaded to about 200 tons only. In somewhat startling contrast to this practice, we now learn of passenger locomotives in the United States that have fitted to them tenders of very nearly this weight. A notable example will be found in the description of the new Atlantic Coast Line 4-8-4 type engines on page 132 in this issue. Carrying 24,000 U.S. (20,000 British) gallons of water and 27 U.S. (24 British) tons of coal, the tenders of these powerful locomotives weigh over 194 tons when ready for a run. They are carried on two eight-wheel bogies with cast steel frames and their bodies closely follow the outlines of a coach, being over 50 ft. long and built up almost to maximum running dimensions. Thanks to the use of water troughs, also to shorter runs and lighter trains in this country, it is unnecessary for express locomotives to be inflicted with an initial handicap of so great an unpaying deadload, the tenders of the largest express types here weighing from 47 to 62 tons only, when fully loaded.

* * * *

The Cylinder and the Blastpipe

In the course of a discussion on the subject of locomotive boiler design at a meeting of the Institution of Locomotive Engineers in London, Mr. W. A. Stanier expressed himself as being puzzled by the fact that a 3-cylinder engine always seemed to require a smaller blastpipe top than would be expected. One of the possible solutions is that with the 3-cylinder locomotive there is not the same volume of steam going through the blastpipe at each pulsation, and it may be that the formula for a 3-cylinder engine should take that into consideration. On the L.M.S.R. the 3-cylinder types generally require a smaller blastpipe than would seem necessary for their power output, and it would be interesting to have this matter further investigated, as apart from this particular reference, we have ourselves heard of the same characteristic in cases other than that of the railway mentioned. Mr. Stanier, in the course of his remarks, went on to say that the L.M.S.R. 3-cylinder 4-6-0 engines on test when working trains under the control of a dynamometer burned from 30 lb. up to nearly 100 lb. per sq. ft. of grate per hour perfectly satisfactorily, and the only factor seemed to be the ability of the fireman to shovel the coal. As we recorded in THE RAILWAY GAZETTE of November 12, 1937, the locomotives on the Bristol—Glasgow trials developed something like 1,800 h.p. when burning nearly 100 lb. per sq. ft. grate area per hour. From this it can be seen that adequate boiler h.p. is even more important than cylinder h.p. if the engine is to do the work.

* * * *

Why Not Knit?

Various methods are practised of forgetting the unwelcome proximity of one's fellow passengers in suburban trains. One of the most effective strikes us as that we recently saw adopted by some women travellers on their way to work, who had brought their knitting with them. Six vigorously wielded knitting needles, by themselves, can command a wide zone of influence, which male minorities do well to keep outside. When each knitter places at her side a capacious bag containing an inexhaustible supply of wool and what are apparently messages written in cipher, the encroachment upon her neighbour's territory provides fuel for a first-rate crisis. Unfortunately, it is difficult to ask her to remove the bag, because the average man does not know what to call it, the mere monosyllable seeming inadequate for such a lordly accoutrement. Equally hard to define are the slowly expanding woollen rectangles suspended from the needles, the purpose of which can be divined only from occasional disturbing motions of the hands and elbows among the knitters, accompanied by low-toned conversation from which such words as " sleeves," " neck," and even " bust " emerge at intervals to alarm the diffident. The only way to kill the habit seems to be for male passengers to embark similarly upon the public manufacture of their garments.

XUM

Railways and the House of Hambro

AMONG the many changes, both political and industrial, which have occurred in Europe during the past century, there can be few if any of consequence which have not been associated with one or other of the great banking houses. The present year marks the centenary of the House of Hambro, and it is therefore not surprising to find that the handsome commemorative volume which has just been issued by Hambros Bank Limited is not merely a financial record, but also a cross-section of European history, for this bank has played no small part in Continental developments, especially those of Northern Europe. The history of the bank begins in 1839, when Carl Joachim Hambro (1807-1877) founded the merchant banking business of C. J. Hambro & Son with offices at No. 70, Old Broad Street, in the heart of the City of London. He gradually built up in the course of years a financial house which, from a humble beginning, has won a recognised place in the international money market and the history of which came to be linked with that of many European nations. Hambro's father was a merchant and banker in Copenhagen, and it was under paternal guidance that C. J. Hambro had experience in Bremen, Le Havre, and the U.S.A., before forming his own business in London. When established here he maintained a keen interest in his own country and helped to finance the defeat of Prussia in 1849 when that country attempted to recapture Schleswig-Holstein from Denmark. The bank also raised Danish loans in connection with the similar war of 1864 when Prussian and Austrian troops secured the segregation of Schleswig-Holstein and Lauenberg from Denmark.

On the railway side, the active connection with Denmark resulted in the firm of Hambro raising the money for one of the first railways in Denmark, which ran originally from Copenhagen to Riskilde, and was extended eventually to Korsør. One of the most recent issues of Hambros Bank to Denmark was in connection with financing the railway bridge from Seeland to Falster, across the Storstrøm, for which in 1933 the Danish Government obtained a loan for £1,000,000. The bridge, which has just been completed, is one of the finest in Europe, and is a splendid example of engineering skill and an important link between Denmark and the Continent. Hambros Bank has also had a long and intimate connection with Sweden and Norway, both during their period of Union and also since Norway became a separate kingdom in 1905, but no direct railway connection is revealed by the present volume. Finland received her first loan from C. J. Hambro & Son in 1909, while still allied with Russia, when the 4½ per cent. railway loan for £1,800,000 was issued. Finland declared its independence on December 6, 1917, and its export trade finance was secured from the British Bank of Northern Commerce Limited, which was founded in 1912 and became merged with the House of Hambro in 1920.

The work of Hambros in connection with the finances of united Italy stands out as one of the firm's principal achievements. A loan for the Kingdom of Sardinia was issued in 1851, and this was the effective starting point towards national consolidation. An alliance with France made in 1858 enabled Lombardy to be taken from Austria, and in 1861 Victor Emmanuel was proclaimed King of Italy at Turin. C. J. Hambro & Son issued a loan of £1,782,000 for the Maremmana Railway, and this was the first of the firm's financial transactions with Italy as such. A big railway flotation was also made in 1887 in which Hambros joined with Baring Brothers—the Adriatic Railway issue of £6,300,000. In 1889 Baring Brothers and Hambro were also associated in the issue of £14,654,000 Italian railway bonds. The scope of activities with Italy steadily broadened, and the House of Hambro is still in close and active relationship with Government and banking circles in that country.

Carl Joachim Hambro—the founder—died in 1877 and was succeeded by his third son, Sir Everard Hambro (1842-1925), who was a Director of the Bank of England and a close associate of such financiers as the first Lord Rothschild, Lord Revelstoke (of Barings), and the late Mr. Pierpont Morgan. At Sir Everard's death, his eldest son, Sir Eric Hambro, assumed the chairmanship of the bank. He retired in March, 1932, when his brother, Mr. R. Olaf Hambro, the present Chairman, carried on the family tradition. The new generation represented by Sir Eric's son, Mr. Charles Jocelyn Hambro, and Mr. John Henry Hambro, son of the late Mr. H. C. Hambro, are now Managing Directors. The bank's close association with the Bank of England was resumed when Mr. Charles J. Hambro was elected a Director of the Bank of England in 1928. He is also a Deputy Chairman of the Great Western Railway Company and a Director of the Railway Finance Corporation Limited, thus continuing in this country an association with railways which has been one of the characteristics for many years of the House of Hambro.

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South African Railways and Harbours

AS shown in the report for the year ended March 31, 1938, a copy of which we have received from Mr. T. H. Watermeyer, the General Manager, the satisfactory improvement in the revenue of the South African Railways, Harbours, Steamships, and Airways, was due to the abnormally heavy traffic resulting from the unprecedented mining, industrial, and commercial activity and the incidence of record of maize, citrus, and other agricultural crops. This improvement was both in comparison with the estimate and with the previous years' figures. Revenue from the combined services was £39,233,639, an increase of £1,990,490 in comparison with the previous year, and total working expenditure on all services, including depreciation and interest on capital, but excluding appropriations from net revenue, amounted to £33,075,555, an advance of £2,903,092. Net revenue appropriations were £5,822,952, against £5,340,204, leaving a surplus of £335,132, which, added to the balance of £1,855,637 from the previous year, gives a total of £2,190,769. Special appropriations of £1,870,000 are made from this sum, leaving a net surplus of £320,769 to be carried forward. As mentioned in the previous report, the resources of the railways were taxed to the utmost by the unparalleled and unforeseen flow of traffic, and the difficulties caused thereby reached a climax during June and July, 1937. With the electrifications of the lines in the Rand area, the installation of colour-light signalling on the more congested sections, remodelling and increasing facilities at depots and marshalling yards, construction of relief lines, &c., the position improved to such an extent that, with the exception of the two months abovementioned, traffic has been moving freely and without undue delay, notwithstanding that a greater volume of traffic was handled subsequent to July, 1937. In a number of instances new traffic and revenue records were established during the year under review. Train-mileage was the highest ever reached, and the revenue-earning ton-mileage exceeded all previous figures.

As regards the results of working the railways only, earnings increased, as compared with 1936-37, by

£1,495,982 or 4·69 per cent., and reached a new record. Gross working expenditure advanced by £2,625,059 or 12·75 per cent. The number of passenger journeys exceeded the record figure of the previous year by 8,979,604, but earnings from passengers dropped by £18,843. Suburban passenger receipts expanded by £18,862, but main and branch line receipts fell £37,705, mainly because the Easter excursion period during 1938 fell outside the financial year under review, whereas the 1936-37 financial year included the 1937 Easter excursion period. Parcels and mails brought in £869,188, a net increase of £4,848. Revenue-earning goods and minerals showed an increase in quantity of 2,693,023 tons or 15·42 per cent., and in earnings of £1,369,772 or 6·84 per cent. The tonnage constituted a record, and the advance was due to the general prosperity prevailing during the year. Coal traffic was greater by 207,606 tons or 2·16 per cent., but was below the record of 10,118,773 tons established in 1926-27, and the coal earnings were £9,497 lower than in 1936-37. Revenue-earning ton-mileage of goods traffic, including livestock, increased by 27·06 per cent. Statistical and other figures relating to the railway transportation service compare as follow:—

	1936–37	1937–38
Passenger journeys	96,496,033	105,475,637
Goods and minerals, tons	17,461,986	20,155,009
Coal traffic, tons	9,612,201	9,819,807
Ton-miles (revenue earning)	5,774,668,688	7,337,148,728
Average haul, miles	211	242
Route-miles open	13,263	13,263
Train-miles	54,766,261	60,397,400
Operating ratio, per cent.	64·57	69·54
	£	£
Capital expenditure (open lines)	153,807,469	156,698,405
Passenger receipts	5,768,878	5,750,035
Goods and mineral receipts	20,033,340	21,403,112
Coal traffic receipts	3,739,468	3,729,971
Total earnings	31,892,791	33,388,773
Working expenditure	18,501,060	21,014,207
Gross working expenditure (including depreciation)	20,593,860	23,218,919
Surplus over expenditure	11,298,931	10,169,854
Surplus over interest, &c.	6,464,021	5,582,106

In working expenses there were increases of 7·50 per cent. under general charges, caused principally by additions and changes in personnel and the merging into salaries and wages of the temporary extra responsibility allowance. Charges to maintenance of permanent way and works were higher by 10·70 per cent., mainly because of additional track maintenance and the merging into salaries and wages of the temporary extra responsibility allowance. The amount charged to maintenance of rolling stock was greater by 11·53 per cent., attributable to the abnormal volume of traffic and the consequent demand for rolling stock. Running expenses increased by 18·15 per cent. on account of additional mileage, and the advance of 14·79 per cent. in traffic expenses was commensurate with the larger volume of traffic. On harbours there was a gross surplus of £718,840, and on steamships one of £7,781. Airways showed a loss of £150,643. Revenue from railways in South-West Africa improved from £371,399 to £486,925, but expenditure advanced from £515,614 to £671,726, so that the deficit on working rose from £144,215 to £184,801. Road motor services with a gross revenue of £612,875 earned a surplus on working of £26,122. Reference is made in the report to the completion during 1938 of electrification in the Reef and Pretoria areas. The new line between Midway (on the Vereeniging—Canada line) and Bank (on the Union—Klerksdorp line) was opened for the conveyance of all classes of traffic on November 6, 1938. Its length of 21 miles 40 chains is laid with new 96-lb. rails, and has a ruling gradient of 1 in 100 in both directions.

An All-Steel Head-on Collision

IN the early hours of September 20, 1938, a collision occurred on the Southern Pacific Railroad at Tortuga, California, when the westbound Argonaut express, No. 5, was turned into a passing loop and collided at about 40 m.p.h. with the waiting eastbound Californian express, No. 44. The cause of the accident was never in doubt, the head brakeman of the latter train having admitted immediately afterwards that he had reversed the loop facing points and realised his error too late to rectify it. Elsewhere in this issue we publish an illustrated account of the principal features of the collision, which was notable as providing the first real accident test for the new so-called lightweight rolling stock of Pullman manufacture when interspersed with the standard American heavy steel cars. The most surprising outcome of the collision is that it was proved possible for a passenger train of steel construction weighing nearly 1,000 tons,* headed by a heavy 4-8-2 locomotive, and travelling between 30 and 40 m.p.h., to strike head-on the almost unyielding mass of another similar locomotive and 700-ton steel train and yet to kill no one in the oncoming train, though both enginemen met their deaths in the impact which destroyed the two locomotives. This fact should not be obscured by the circumstance that eight passengers and one engineman were killed in the standing train, all the passengers being at one end of a lightweight steel car which was telescoped 18 ft. by a heavy baggage car. From the aerial view we reproduce of the wreck it will be observed that the lightweight car which was fourth from the engine in the moving train (No. 5) was nipped with its roof against the underframe of the car in front and its floor received the thrust of the remaining ten cars of the train weighing about 700 tons and travelling at over 30 m.p.h. Although damaged beyond repair, it was not crushed flat, and no one in it was killed. The strength of the lightweight construction was thereby proved, but, as might have been expected, the actual test of a collision showed that certain members might be made more strongly with advantage. The lightweight cars were built of high-tensile Cor-Ten steel, and an examination of photographs and descriptions of the wreck indicated that when compared with the carbon-steel of the older cars, it had a tendency to break rather than to bend, despite the fact that static tests had shown that sections of the car could resist the buffing standards laid down by the American Government for its postal cars which are generally taken as the criterion of strength. These regulations specify a safety factor of 2 against a buffing force of 180 tons, which means that 360 tons must be successfully resisted; and although in certain tests the cars withstood more than this, a test by the Pennsylvania Railroad of a similar car some time after the construction of those in the collision, was less satisfactory. There seems some doubt whether the weaknesses revealed in the latter test had been overcome in the cars in the collision.

Whether or not the underframes withstood the thrust is not the vital point in the case of the telescoped lightweight steel car; for in this case the blow was given above the floor line, and although postal regulations cover such blows by stipulating the resistance against a force acting 18 in. above floor level, the Cor-Ten anti-telescoping posts sheared, and the car was telescoped. But an extenuating circumstance is that the heavy ordinary second car in train No. 5 was telescoped by striking the rear of the engine, despite its carbon steel reinforcing posts which were bent backward, and further that it was telescoped for the same distance as the lightweight car of No. 44, namely, 18 ft. The low coupler height standard in America, which is 35

* Weights are given in British tons of 2,240 lb.

XUM

in., or 7 in. below British height, inevitably causes the thrust of the draught and buffing gear to be well below the centre of mass of the car, and thus tends to depress the end of the car struck, and to elevate its far end. This happened, without doubt, in the present case and was the prime cause of the telescoping and loss of life. Comment has already been made in America that the lack of a vertical hold by the knuckle type of automatic coupler was an accessory in permitting one frame to override another, and it should be noted that notwithstanding these couplers, and the use of Pullman vestibules, both of which reduce the tendency to uncouple in collision, a large number of cars came adrift. Use of a device with a vertical hold, such as the Tight-Lock coupler, would appear advantageous. Doubt was expressed in the Bureau of Safety Report as to the advisability of intermingling lightweight with standard steel stock, and indeed such marshalling puts the lightweight cars to the severest tests. On the whole, however, considering that stresses and blows set up in a collision are momentarily enormous and their number incalculable, the lightweight cars seem to have stood up remarkably well, and with modifications in the design suggested by this accident, should prove still better in the future.

The signalling arrangements were of a type common in the United States, comprising track circuit automatic signalling and hand worked loop points, electrically detected and operated by the train crews. The control circuits were arranged on the so-called "straight" system, consistently favoured, we believe, by the Southern Pacific, but this had no bearing whatever on the accident. With a train standing on the loop and all points normal the signals would show "proceed" to an approaching train, authorising it to run through at speed on the straight track. This in fact prevailed for a brief interval after the waiting train had stopped in the loop, which it took in obedience to the despatcher's orders, delivered to both trains not long before. They frequently passed each other at Tortuga, and although the westbound train was superior by rule it was generally ordered to take the loop. With a train waiting on the main line an approaching one necessarily finds the signals against it and slows down, later working into the loop. The head brakeman of the Californian was probably led into his disastrous blunder by momentary forgetfulness that the usual arrangement of passing was altered on this occasion. Whatever the reason, there is little doubt that the Argonaut was not very far from the home signal when he reversed the points. Such action would throw the signal to "danger," and the driver—who, with his fireman, lost his life—apparently saw that happen, as he was heard to whistle and his conductor felt a sudden brake application just before the crash. The other driver had a remarkable escape, but his fireman was killed. Looking out ahead, ready to identify the oncoming train, he suddenly noticed in the glare of its headlight on the rails that the points were reversed, and had just time to jump clear. From May, 1938, until the date of the accident, on 32 of the 34 occasions when the same head brakeman of No. 44, the Californian train, had been on duty, No. 5 had been ordered by the despatcher to take the loop, allowing No. 44 to use the main line. These orders probably indicated the despatcher's assumption that No. 44 would normally reach Tortuga before No. 5, which, however, would be there so very shortly afterwards that the delays would be least if the former were permitted to run direct into the straight, so avoiding a stop outside the loop for the brakeman to set the points for the loop. This arrangement would, of course, also necessitate No. 5 stopping outside the other end of the loop, but only momentarily. It may be presumed that only when No. 44 was expected to arrive some time before No. 5, would a non-stop run through the straight be possible for the latter.

The accident is therefore a plain case of changing the route in front of a train, one of the most serious operating mistakes that can be made and always possible unless some positive form of holding the route is provided. Even at ordinary well equipped signal boxes, observance of rules is most generally relied on to prevent it. Ordinary interlocking is, as it were, a kind of protection at the instant, but it has no time or other controlling feature in it. The assurance it gives can be taken away by carelessness or mistake at the last minute, after an approaching train has relied on its protection. The serious derailment at Villeneuve-St. Georges, on the then P.L.M. Railway, on July 29, 1937, was caused by a signalman trying—of course in defiance of the rules—to change a junction in front of a train which had been incorrectly described. It is to meet such blunders that electric approach and other forms of route locking have been introduced and generally applied in modern signal boxes, including some manual ones. With loop points operated on the ground, as is so very general in America, simply detected with the running signals, the risk of untimely operation is always present unless they are route-controlled in some way, as they sometimes are. The risk of error is probably somewhat greater than it is with points worked from a signal box and the consequences likely to be much worse, as a rule, since one line at the passing place is necessarily occupied, as in the case at Tortuga. A strict rule, quoted in our summary, is in force with the object of preventing any foolish or hasty action on a trainman's part, and has presumably been found reasonably sufficient. We are not aware how frequently irregular operation of loop points has been experienced in America, but probably not enough to warrant the general extension of approach-locking to hand switch-stands. Nevertheless some control of this kind would afford positive protection against such a terrible mistake as this unfortunate man committed, and we are surprised to find no word of comment on the matter in the report.

* * * *

Progress of the "Square Deal" Proposals

THE past week has not witnessed any spectacular developments in connection with the railway companies' application for a "square deal" in connection with the statutory control of their charging powers for merchandise traffic. On January 19 the special committee of the Transport Advisory Council met in public to hear evidence submitted on behalf of trade organisations, including a memorandum from the Traders' Co-Ordinating Committee, and on the following day continued discussions in private. On January 24 the railway companies' representatives resumed their discussions with the liaison committee of the road haulage organisations for the purpose of endeavouring to reach some agreement, as it is recognised that the possibility of the committee being able to present a unanimous report to the full council will depend largely upon the outcome of these discussions. After a very prolonged discussion, the meeting was adjourned to January 31 but no statement was issued as to the extent of the progress made. In the meantime the railway representatives continued their talks with the dock and harbour authorities on January 26, while on February 1 they have arranged to resume their discussions with the iron and steel interests. It is proposed at present that the special committee should meet again on February 2 to hear evidence on behalf of the road haulage organisations.

The companies' position has been further clarified in a speech made by Lord Stamp to the Manchester Chamber of Commerce on January 18 (see page 154), when he

emphasised that the main object of the companies was the establishment of a comprehensive system of disciplinary control in rates structure for all forms of transport, and reminded the chamber that the companies have never taken the view that transport should be completely free from control in all directions. He further indicated that the railways would be ready to take their share in all restrictions in the public interest which are of general application, and claimed that the repeal of all restrictions on the quotation of railway rates for goods traffic was sought not with a view to the final stage being necessarily free from regulation, but with the knowledge that, starting from freedom, the imposition of common legislation would be much easier. He also made it clear that, while the companies desired freedom to combat the competition of all forms of transport at the particular points at which it occurred, they had no desire or intention to make any discrimination at all between traders where their circumstances and traffics were identical, except where such inequalities might be forced upon them as between different areas by reason of competition from other forms of transport. He also reiterated the point that if it could be shown that this freedom for which they were seeking would involve any danger or hardship on any section of the community, the companies would be glad to consider how to provide against it, this being the reason for the amplification of their proposals which was announced in last week's issue.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Square Deal Campaign

London Midland & Scottish Railway Company,
Office of the Vice-President,
Euston Station, N.W.1
January 23

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Mr. Barclay's letter in your issue of January 20 suggests a number of tests of the comparative efficiency of British and other railways. Most of these tests are based on statistical data of an average type which do not afford comparisons with like things. May I take one illustration? The net ton miles per engine hour on the North of Scotland portion of the L.M.S. in 1937 was 76 per cent. greater than on its central portion in England, the difference being due not to differing efficiencies but to the nature and meagreness of the traffic in the North of Scotland.

The second point is indirect criticism of the railway dining car system in this country, and the short answer to that is the very high number of meals served notwithstanding the short journeys in this country. It is suggested that no adequate attention is given to cleaning, heating, and ventilating passenger equipment. With that I totally disagree. It is further suggested that the railways do not have a commercial research department, nor endeavour to meet the requirements of their customers. That, also, is incorrect.

It is idle to compare the British railways with the General Motors Corporation. I am not aware that the latter has any statutory requirements such as those placed on the British railways, in regard to their business activities. It is stated that the General Motors Corporation's sales in 1937 were over £300,000,000, and the question is asked, " Does that suggest anything? " It suggests to me that they had a very satisfactory output of their products, but it suggests nothing as to the efficiency of the British railways.

Yours faithfully,
W. V. WOOD

January 18

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Mr. John Gardner's letter in your issue of Friday, January 13, is to be regretted for the reason that his facts are hopelessly out of date. The railway companies do not today claim to be the largest " taxpayers " (he means ratepayers) in the country. The reason is plain. Today not a single mile of railway track in Scotland has for rating purposes any annual value, or put otherwise the annual value of the running lines in Scotland today appears in the Roll of the Assessor of Public Undertakings (formerly Railway Valuation Roll) at nil. If a subject has no annual value it follows that its owners can have no liability for and do not pay local rates in respect thereof. The same, for the most part, applies in England. Mr. Gardner, when he took up his pen, must have been thinking of the time when the annual value of the running lines of his old company (the Caledonian Railway Company) was entered in the Railway Roll at over £1,000 a mile.

As regards stations and other railway buildings, the position today is that the railway companies' net revenue is not sufficient to give the old annual value of 5 per cent. of the cost of land and buildings. As regards maintenance of roads on bridges the measure of the railway companies' liability is, according to decisions of the Law Courts, limited to the standard prevailing at the date of construction. The railways want all possible help, but the arguments in favour of help should not be based on false premises, for thereby only the enemy is assisted.

I am, &c.,
" FACT "

January 2

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The Railway Companies' Association has launched a great publicity campaign asking for a " Square Deal," and no thinking person will deny that there is much justification for the claim. But one cannot read in one of their leaflets " Red tape is tough; old prejudices die hard " without the thought that the practice of the British railways is itself steeped in " old prejudices " which do not even die hard, but rather seem immortal.

Of recent years high-speed streamlined expresses have been introduced between London and important centres, and, broadly speaking, fast services from and to London are good; but a study of past timetables reveals that in many instances there has been virtually no alteration in local train services over a long period of years. It does not seem to be clearly enough realised by the companies that for local travel the frequency and convenience of the service are of greater importance than speed. To reduce the journey time of branch trains by a few minutes, as has been done in some cases in recent years, can have very little effect in inducing local passengers to use the train, for in most cases the bus journey time could not compare with that of the train even before the cut in the latter. The fact that it takes 40 min. to get from Fordingbridge to Salisbury by bus, but only 30 min. by train, makes little impression upon the countryman, and in any case the advantage is more than neutralised by the fact that there are six trains a day, but a half-hourly service of buses. Obviously it is not worth saving 10 minutes on the actual journey if one has to wait a couple of hours or so to start!

Where it has introduced electric services, the Southern Railway seems to have appreciated the value of regular frequent local services even in rural areas, but all four companies appear to ignore this point in the case of steam services. Even in urban areas we have the same story. On the West London Extension line there is a fairly frequent service to cater for workmen's or season ticket traffic in

the busy period, but at other times a service quite useless for attracting the slack-hour traffic. It is within the experience of one of the writers that a large passenger traffic exists between points on this line. Except for the throughout journey there are no direct bus facilities, and the alternative to travelling by train is a circuitous bus journey involving one, and sometimes two, changes. Yet hardly anyone thinks of using the train, although it is always a much quicker journey, partly because of the uninviting, and in some cases inaccessible stations, and partly because of the notorious infrequency of the service. People prefer to face the tedious bus ride, and in many cases where the journey is desirable but not necessary, decide that they will not bother to go at all.

In the provision of fast cross-country services, too, the railways are notoriously lacking in enterprise. It is argued that economic loading can only be maintained by combining the small amount of through traffic with local traffic making numerous intermediate stops inevitable. Yet no comprehensive attempt has been made to exploit the obvious advantages of the light fast railcar to overcome this difficulty. Certainly, at long last, the L.M.S.R. has provided such a service experimentally between Oxford and Cambridge, but the diesel train is so timed that it just fails to make useful cross-country connections. Moreover, no times appear in the public timetables, and the local announcements, stressing the fact that the train is "liable to withdrawal without notice," might almost have been designed to discourage travellers from using the service.

Another example of the railways' failure to meet the needs of growing cross-country traffic is the deplorable inadequacy of the service from the now important industrial Luton-Dunstable area to Birmingham. The two routes between these points, *via* Leicester and *via* Leighton Buzzard, both involve at least one, and nearly always two changes, and the fastest journey time is a little under 3 hours, the normal being 3½ hours. As a result, the considerable number of Birmingham and Coventry people now working in Luton and Dunstable travel to their home towns *via* London, or much more frequently in their friends' cars!

Luton provides at least two more examples of railway lack of vision. Luton L.M.S.R. station is being entirely reconstructed, but with no alteration in the layout of the tracks, which can be seen, even by the layman, to be a hindrance in coping with present traffic, let alone that of the future Although workmen's fares to London are available by the 7.26 a.m. L.N.E.R. train from Luton *via* Hatfield, they are not available by any L.M.S.R. train after 6.44 a.m. (6.27 a.m. on Saturday), although fares are pooled and there are trains at 7.0 o'clock and 7.32 both reaching London before the L.N.E.R. connection. This causes an unduly large number of people to travel by the slow and circuitous L.N.E.R. route, resulting in the transfer at Hatfield into the already overcrowded suburban service of passengers who could more easily be carried by the direct and less congested L.M.S.R. line.

Much could be done by the railways in the matter of good signs and directions, lack of which at present confuses passengers and tends to discourage rail travel. Should not the name of each station be clearly visible to passengers in any part of a train which *has stopped* there, as it is at all London Transport stations? Also could not all trains have large, clear (and correct) destination indicators on every coach? This is particularly important in the case of trains carrying portions for several destinations. Indicators should be installed on platforms giving similar information for each departure. Such simple, inexpensive devices would go far in dispelling the idea prevalent among a generation used to the convenience and simplicity of the private car, that railway travel is a complicated and irritating business. Undoubtedly such an idea is widespread today, and cannot be wondered at when one considers, among many things, the intricacy of public timetables and the variations of fares and fare restrictions that still persist. The fact that the Southern Railway has in operation no fewer than ten different third class single fares between London and Ramsgate, can only leave the average person wondering.

To meet the present situation by withdrawing train services is no remedy; it can only result in turning more and more passengers over to public or private road travel. Unless the railways are prepared to revise their services and their ideas radically, there does not appear to much future for them. They must first provide modern stations and trains, and services designed expressly for the convenience of the public, who will then look upon the "Square Deal" campaign with a more sympathetic eye.

Yours faithfully,

G. W. ADAMS,
Common Road,
Kensworth, Beds.

JAMES M. JOHNSTON,
22, Dalkeith Road,
Harpenden, Herts.

I. WATKIN,
26, Gt. Northern Road,
Dunstable, Beds.

Comfort and Coach Weight

Northern Aluminium Co. Ltd.,
Banbury, Oxon.
January 13

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The letters by "Criticos," "Veritas," and "Scrutineer" [see our issues of August 15 and December 23 last year, and January 13 last—ED. *R.G.*] deal with a subject which must be causing railway engineers some anxiety. The modern practice of continually improving passenger amenities and providing improved facilities offsets the designers' efforts in the direction of weight reduction, and the weight per passenger seat has been on the increase for a number of years. When the luxury of armrests was introduced into third class compartments and the seating capacity reduced to six per compartment, the weight per passenger seat was increased by 33 per cent. The introduction of air-conditioning and improved additional dining facilities in the new high-speed set trains has again offset the designers' efforts to reduce weight per passenger seat, and, unless these trains are limited to a certain weight and, of course, carrying capacity, the schedule is apt to suffer, as pointed out by your correspondents.

When the high-speed set trains were introduced on the Continent and in America, new lightweight coaches were designed, with the result that a greater number of passengers could be accommodated in the limited weight available, and although the weights of American trains will not bear comparison with those of British trains, the proportionate reduction is worthy of consideration. Improvements in design, the use of high-tensile steels and welded construction, have helped in this direction considerably, but in order to obtain the maximum advantages from limited weight trains it would appear to be necessary to effect drastic car weight reductions and obtain maximum passenger accommodation without lowering the present high standard of comfort.

The advantages of high strength aluminium alloys have long been realised in the aircraft and transport industries, and these alloys could, with advantage, be used in the construction of railway coaches. Aluminium alloys are available with ultimate tensile strength equal to that of mild steel and with high fatigue values and good elongation, whilst the lower Young's modulus of aluminium is an advantage, as the material is better able to absorb shock in collision. High first cost may be given as the main objection to the use of aluminium alloys, but when it is considered that the average life of a railway coach is 30 years, it would appear that the advantages to be gained in other directions would more than compensate for this increased cost.

As an example, an eight- or nine-coach limited weight set train with a seating capacity, allowing for dining cars and brake vans, of approximately 200 to 240 passengers, could be replaced by a ten- or eleven-car train using aluminium alloys and seating approximately 260 to 300 passengers, without any increase in overall weight.

Yours faithfully,

C. W. SHARP

PUBLICATIONS RECEIVED

Welding of Steel Structures.—Report of the Welding Panel of the Steel Structures Research Committee, Department of Scientific and Industrial Research. London: H.M. Stationery Office, Adastral House, Kingsway, W.C.2. 9½ in. × 6 in. 326 pp. Illustrated. Price 6s. net.—This report consists of an introductory statement on the research programme, and comprehensive chapters on a statistical examination of the strength of welded joints, non-destructive methods of testing welds, fatigue resistance of welded joints, and a survey of the existing published information. An immense quantity of facts and figures has been compiled in this book, mostly based on the results of nearly 2,000 mechanical tests carried out by the above-named committee in co-operation with 66 British firms, and usefully compared with results of research abroad. One of the main assets of this book consists in giving, in condensed form, definite conclusions at the end of individual chapters, and these, it is felt, may prove of particular value to structural and welding engineers.

While the subject of welding has become one of increasing interest to railway engineers in recent years, the chapter dealing with fatigue problems should particularly appeal to designers of railway bridges. They will find most useful information, both theoretical and practical, in the results of various kinds of fatigue experiments on weld metal and on joints with fillet welds and butt welds, also on the possibility of fatigue failure as a result of vibration and shock. Now that a start has been made in this country with putting into service an all-welded railway bridge, the reliability of welded joints under fatigue will be a decisive consideration in future schemes. The last chapter, covering more than 100 pages, gives what is perhaps the most comprehensive survey of published welding information yet undertaken, and this, by its able and critical conclusions, adds considerably to the practical value of this book.

Deutscher Reichsbahn-Kalender, 1939. Edited by the German State Railway Press Service. Leipzig: Konkordia-Verlag Reinhold-Rudolph. 160 sheets, fully illustrated, with coloured pictorial cover. 10¼ in. × 6¾ in. Price RM. 3.20.—We had wondered whether the motto of this thirteenth *Reichsbahn-Kalender* might be *Reichsbahn und Weltpolitik*, but beyond the fact that it now contains views taken in Austria and the Sudetenland, including one showing a squad of men repairing mined permanent way in the latter, there are no such tendencies. On the birthday of the Head of the German State, there is (as is customary) a picture of him at a railway carriage window. Actually, the motto this year is *Reichsbahn und Landschaft*, to be freely translated as "Railway and Scenery," and the result of this, coupled with German photographic skill, is inevitably pleasing. The quality is almost unvarying, whether in a dizzy view from a mountain, with a map-like railway running along a green valley about half a mile below, or in a nice little picture of a pretty girl (not *too* near the camera) waving to a branch train in pleasant surroundings. The *Anschluss* has certainly enabled a number of photographers to enjoy themselves in fresh woods. For the first time, the Brenner line, the Arlberg line, the Semmering line, the Tauern, and the most exciting parts of the Mittenwald line make their appearance in the *Kalender*. The "glass trains" (observation railcars with glazed eaves and sliding roofs) are very much in evidence, and strike us as a feature well worth copying on one or two of our own routes, like that from Glasgow to Mallaig. Better even than the "glass train" is the completely-open observation car, as used for excursions in the mountains of Saxony. Travel in one of these, of course, is essentially a fair-weather diversion.

The new State motor roads are in evidence, though sparingly, for apart from their bridges, they do not lend themselves to particular beauty of photograph. It is a contrast for one accustomed to seeing a solid jam of motor vehicles crawling along an English road never designed for such traffic, to look on a picture showing one of these tremendous German *Autobahnen* graced, as far as the eye can see, by one bus and a motor cyclist. The electric train, like the motor road, is rather a difficult subject for the photographer who wants to capture beauty as well as interest. But in Germany the electric train often has the advantage of mountainous surroundings, which effectively fill the sky where otherwise one would miss the glories of mounting smoke. Where neither steam nor electric traction are involved, the pages of the almanac show and suggest an increasing use of internal-combustion railcars on secondary lines, rather than a spreading of high-speed railcar services. The incorporation of the Austrian Federal Railways has resulted in a great increase in the number of different types of locomotive, railcar, and vehicle, for while the Reichsbahn as it was last year, had reached a high degree of standardisation, this has not been so with the Austrian lines. The coloured top sheet of the *Kalender*, reproduced from a painting by L. Heinemann, is an unconventionally conventional view of a train leaving a mountain town, on a particularly frigid winter evening.

Great Western Docks, 1939.—Great Western Railway, Chief Docks Manager's Office, Cardiff. Produced and published by H. N. Appleby Limited by arrangement with the company. 11 in. × 8 in. × 1 in. 336 pp. and advertisements.—As might be expected in a publication dealing with a phase of its activities in which the Great Western Railway takes particular pride, this handsomely produced handbook well earns a place among standard reference books for traders. The striking appearance of this publication has not been achieved at the expense of the purpose for which it is intended. It is informative as well as attractive. Each of the company's docks receives a separate description, setting out the nature of its trade and the facilities provided. In every case there are several full-page illustrations and a folding plan. The back pages of the handbook are devoted to tables of trade statistics, dock accommodation, steamship services, dock rates, cranage rates, tide tables, and miscellaneous information. There are in addition a number of useful "trade articles" on important trades and transport facilities. A general railway map is included.

L.N.E.R. Tide Tables.—The L.N.E.R. Tide Tables for 1939 have just been issued and may be obtained free from the portmaster at the port concerned. The tables are bound in three booklets of a size handy for the pocket, and contain information regarding high tides, depth of water, phases of the moon, and accommodation available at the various docks. The volumes deal respectively with Middlesbrough Dock, the Hartlepools, and Hull, Immingham, and Grimsby.

Index to the Literature of Food Investigation. Vol. 10, No. 1, June, 1938. London: Department of Scientific and Industrial Research, 16, Old Queen Street, S.W.1. 9½ in. × 6 in. 94 pp. Paper covers. Price 4s. 6d. net.—This index covers papers received by the Department of Scientific and Industrial Research in the period January 1 to March 31, 1938. A brief review of the contents is given for every work listed. A section on engineering refers to articles in the technical press dealing with mechanical refrigerating machinery on rail and road vehicles conveying perishable foodstuffs, and with installations at railway goods stations dealing with such traffic. Copies of the index may be obtained from His Majesty's Stationery Office or its agents.

Synthaprufe.—We have received from Powell Duffryn Associated Collieries Limited an illustrated booklet describing the qualities of Synthaprufe liquid waterproofing and jointing material. Upon exposure Synthaprufe sets rapidly and forms a black flexible film similar in appearance to rubber. Its melting point is at approximately 170° F., but after being in use for a few months this increases to 212° F., although it has been shown in practice that the material will withstand higher temperatures without flowing. The booklet illustrates the application of Synthaprufe for such duties as waterproofing brick walls, and sealing pipes. Similar to Synthaprufe is another emulsion known as Synthacold, containing 62 per cent. of synthetic refined tar, which is intended as a finish for use on paths, drives, and roads.

XUM

THE SCRAP HEAP

Last Saturday, January 21, the L.M.S.R. conveyed 15,000 football enthusiasts in 30 excursion trains to cup tie matches in different parts of the system. Nine specials ran to Sheffield, where there were two matches; and seven to Leicester.

* * *

A slight railway event took place at Cologne on the 13th ultimo. A train gaily decorated with flags and bunting left the station of that city conveying coal for Italy. It was the first consignment of the products of the Westphalian mines that went through the St. Gothard Tunnel, hence the ceremony.—*From "The Railway Official Gazette" of August*, 1882.

* * *

WHERE THE MONEY COMES FROM

The following lines are a tribute composed by a railway divisional engineer to the members of the staff who perform an essential but usually unsung service :

My tale is of those gentlemen
Who sit on stools and wield the pen
From early morn to close of day
That all of us may get our pay.

Inside an office out of sight,
Each man works with all his might,
From piles of forms of sombre hue
To calculate the wages due
To countless men of every grade
According to the hours they've made.

Snowstorm duties or watching slip,
Examining lengths or points to clip,
Painting stations or clearing drains,
Fettling up track or flagging trains.
Mending fences or mowing banks,
Repairing bridges or cleaning tanks,
Whatever job is on the sheet,
They calculate the payment meet.

Deduct for hours on mealtime spent,
Deduct for stamps, perhaps for rent,
Until they've found the total sum
That should be paid to everyone.

And so we thank you gentlemen
Who sit on stools and wield the pen
From early morn to close of day
That the rest of the staff may get their pay.

* * *

An interesting account of an experience during a Zeppelin raid on the Midlands in the war appeared recently in one of the L.M.S.R. staff journals. The writer, Signalman J. Vowles, now of Station West box, Nottingham, was then in charge of Bennerley Junction box, near Ilkeston Junction.

This box, he said, used to control the junction for trains from Ilkeston Town to Nottingham *via* Kimberley. Bennerley furnace are in front of the box and the Great Northern Railway viaduct carrying the line from Nottingham to Derby runs at the side. It was January 31, 1916, when the first Zeppelin raid was made . . . the furnaces were on full blaze, the red-hot pig-iron just released from them lit everything up.

At 8.20 p.m. Toton Control called him up and told him to stop everything . . . the *Zeppelins were here*! He had pulled all signals off for a train, which had already passed the distant. Putting all signals on and the box lights out, he took his hand-lamp, went out and stopped the train. Whilst he was out of the box the Zeppelin dropped one bomb at the back and two straight in front, absolutely wrecking the structure; the splinters taking pieces out of the levers, which still carry their scars. A lot of people took souvenirs away, Signalman Vowles said, but the one that he still had was an almanac perforated by a splinter through the very date the box was bombed. He would always remember the episode and thank the telephone and the train coming, which no doubt saved his life.

* * *

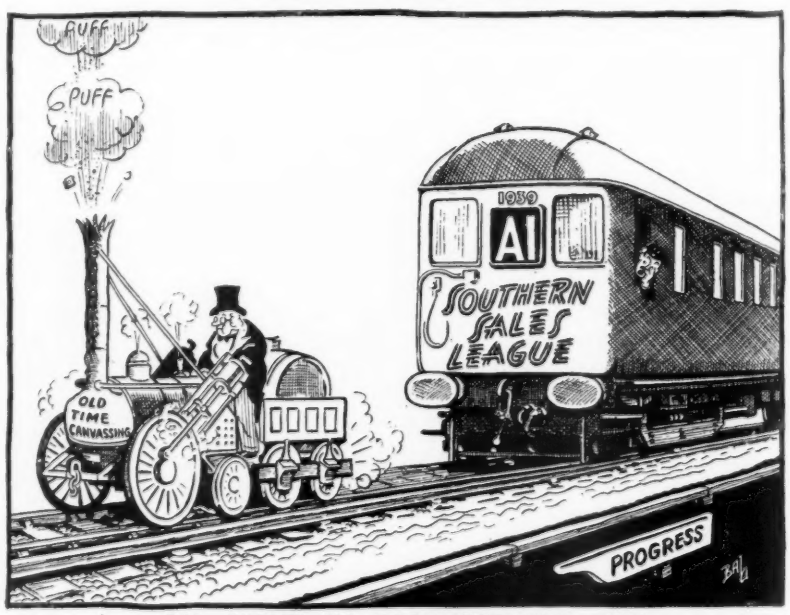
Mr. W. E. Coates, believed to be the only bearded stationmaster on the L.M.S.R., is to retire from his duties at Kettering on February 8, and henceforth devote himself to his three hobbies of gardening, bee-keeping, and fishing. A tall, distinguished figure with his neatly trimmed white beard and flowing moustache, Mr. Coates is a familiar personality to travellers on the St. Pancras route. He can recall the days of footwarmers, when railway compartments contained no cushions, and when dining cars on long distance trains were non-existent. Receiving royalty he simply regards as part of the normal day's work. "Our own Royal Family," he said in an interview, "are ideal travellers. I wish I could say the same of all our other passengers."

* * *

A member of the National Farmers Union recently complained that the Pigs Marketing Board had caused an animal to be sent from Cornwall to London by train at the cost of 55s. The Great Western Railway subsequently stated that a less particular pig could have made the journey in a crate for as little as 13s. 11d. This one apparently insisted on a whole cattle wagon to itself.

Obverse and reverse of an eighteenth century token issued by the Coalbrookdale Company in 1792, showing the inclined railway at Ketley and the first iron bridge

CLEAR THE LINE!



ALL RIGHT IN GRANDFATHER'S DAY

With Acknowledgments to the "Daily Dispatch"

"Southern Sales" the news review of the Southern Railway Traffic Department, has adapted a well-known "square deal" poster to its own campaign for modern methods in selling transport

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

ARGENTINA

Fruit Transport Facilities

As the result of discussions between the Minister of Agriculture and representatives of the railways and river steamship companies concerned, it has been decided to arrange for the following additional facilities for the rapid and economical transportation by rail and river of fresh fruit from the territory of Misiones to Buenos Aires :—

(*a*) The construction by the Ministry of Public Works of a large warehouse at the port of Posadas on the Paraná river, in proximity to the Argentine North Eastern Railway station, to provide proper storage accommodation and avoid damage by exposure. (*b*) The establishment by the Mihanovich Steamship Company of a regular service of river steamers in connection with the railway. (*c*) The construction by the Argentine N.E.R. of suitably ventilated fruit wagons, of which 50 are to be completed in time to handle the forthcoming fruit crop. (*d*) The minimum tariffs which at present apply only to consignments of 5,000 kg. or more by each individual shipper, shall in future be applicable to joint shipments by several producers, when they reach that figure.

The transport representatives stated that they were not in a position to grant reduced tariffs at present, owing to the expenditure involved in connection with the establishment of the new services and the fact that the present volume of traffic did not justify this step, but as soon as it did, the question would be considered.

C.A.R. New Types of Season Tickets

The Central Argentine Railway has issued a new type of first class season ticket, available for a fixed number of return journeys between Buenos Aires and Rosario, Buenos Aires and Cordoba, and Rosario and Cordoba, and *vice versa*, at very reasonable fares. The return journeys must be completed within three months of the date of issue. The tickets are of two types, one being available for 10 return journeys and the other for 11 to 15 journeys, and can be used for journeys by any ordinary train. If utilised for travelling by the air-conditioned express Cordobés, the customary supplementary charge for a seat in the semi-Pullman car is made in addition.

The same company has also issued a new type of first and second class monthly season ticket, which confers the right to the free conveyance of luggage up to a maximum weight of 50 kg. These tickets are issued for journeys of not less than 100 km., and are subject to the same conditions as those which apply to ordinary season tickets. A passenger in possession of one of these tickets has the right to take with him into the coach luggage up to 20 kg. weight, and not exceeding a determined volume, the remainder being carried in the brake van. Should the total weight of luggage of any one passenger exceed the maximum of 50 kg., the excess quantity is charged for at specially reduced rates.

Reduced Goods Rates on the C.A.R.

In order to enable it to meet more efficiently the competition from road and river-cum-road transport within its zone of influence, this company has been authorised by the National Railway Board to apply a new experimental system of rates for general merchandise despatched from Buenos Aires, Rosario, and Santa Fé to Córdoba, Rafaela, San Francisco, and various intermediate towns. Hitherto, this competition has been met by proportionate reductions in the existing charges based on the goods classification comprising 10 classes, but the rates which are now being put into operation are governed by a much simplified method consisting of 3 classes only.

The first class is limited to articles of high value and fragile nature which figure in classes 1 and 2 of the official classification ; the second class comprises articles figuring in class 3, whilst the third embraces all other and therefore the majority of the articles provided for in the official classification. The rates are on a kilometric basis, which has been fixed in relation to the competitive conditions, and are in accordance with the type of road and the influence of the river transport. In addition, prices are quoted for minimum quantities of 100 and 1,000 kg. in the first group ; 100, 1,000, and 5,000 kg. in the second, and 100, 1,000, 5,000, and 10,000 kg. in the third.

Harvest Prospects for 1938-1939

The first official forecast of the forthcoming harvest, issued by the Ministry of Agriculture on December 16, estimates the probable wheat crop at 8,600,000 tons, an increase of over 3½ million tons, or 71 per cent., over that of last year, and 43·3 per cent. above the average for the last 5 years. Barley has declined by 6·5 per cent., as compared with last year ; but linseed and oats show increases of 5·2 and 8·9 per cent., respectively. The following are the estimated tonnages : linseed, 1,620,000 ; oats, 750,000 ; and barley, 480,000 tons.

INDIA

Removal of Railway Tracks Demanded

At a largely-attended public meeting recently held at the Howrah Town Hall (Calcutta), resolutions were adopted urging the Howrah Municipality to take steps for the early removal of the tracks of the Howrah—Amta and Howrah—Sheakala Light Railways from the jurisdiction of the municipality, and thanking the Chairman and the commissioners of the municipality for their decision to terminate the leases for the running of the railways on their expiry in September, 1939. The President explained that about 50 years ago, after an agreement between the Howrah Municipality, and the Howrah and Hooghly District Boards, permission was accorded for the laying of light railway lines along thoroughfares within the jurisdiction of these bodies. It was not then visualised that Howrah would so soon become a large and important suburb in which a frequent service of trains on its roads would be a source of nuisance and danger.

The Howrah-Amta, and Howrah-Sheakala Light Railways are operated by private companies managed by Martin & Co. Ltd. of Calcutta.

Overcrowding on Trains

In the Legislative Assembly and elsewhere, the Indian railways are frequently accused of responsibility for the overcrowding of their trains. Accordingly, a census of all classes of passengers on all trains was taken at different points on the East India Railway system during the week ended March 26, 1938. Out of a total of more than 5,500 trains checked during this period, overcrowding was detected on 61 trains only, and even this was attributable largely to exceptional travel in connection with the *Kumbh Mela*.

Students' Excursions

The increasing recognition of the value of travel as an addition to the educational curricula in schools has led most of the Indian railways to offer many facilities and concessions for students' excursion parties. Recently, with suitable encouragement from the South Indian Railway, 600 students of the Hindu Theological High School, Madras, visited Chidambaram, Tanjore, and Trichinopoly. At Trichinopoly, Mr. C. A. Muirhead, Agent & General Manager, South Indian Railway, and some departmental officers met the special train by which the excursionists travelled. The Trichinopoly District Teachers' Guild organised a similar Christmas excursion that left Trichinopoly on December 26 with about 350 students. The itinerary included visits to Tanjore, Chidambaram, Mahabalipuram, and Madras.

Red Arrow Transit

As further evidence of the concern with which the railways are watching the interests of the merchant and of trade in general, the B.B. & C.I.R. has introduced a new organisation on the lines of what is generally known as the Green Arrow service. To be in keeping with that company's Red Arrow sign applied to the Frontier Mail service, however, the new freight system is known as the Red Arrow Registered Transit System. Under it a registration fee of Re. 1 a consignment over and above the ordinary freight charges secures for the merchant a continuous watch over

XUM

the consignment by the Red Arrow clerk during the entire period of transit over the system. This insures that the consignment is not delayed *en route*, and enables the sender to ascertain its whereabouts at any time during transit; and the consignee is also informed of its arrival at destination. The railway has already had proof of the popularity of this scheme despite the short period for which it has been working. The system operates at present only from Bombay, but is likely to be extended in the near future to other sections of the railway.

UNITED STATES

New 4-8-4 Atlantic Coast Line Locomotives

The Baldwin Locomotive Works recently delivered to the Atlantic Coast Line 12 new 4-8-4 locomotives for fast services between Richmond and Jacksonville, the trains loading up to 20 or 21 cars, mostly Pullmans, and the average speeds exceeding 55 m.p.h. The following are the leading dimensions of these powerful engines :—

Cylinders, dia.	27 in.
,, stroke	30 in.
Piston valves, dia.	12 in.
,, max. travel	7½ in.
Coupled wheels, dia.	6 ft. 8 in.
Evaporative heating surface :—	
Flues and tubes	4,181 sq. ft.
Firebox	568 ,,
Total	4,749 ,,
Superheating surface	1,497 ,,
Combined total	6,246 ,,
Firegrate area	97·75 sq. ft.
Boiler pressure	275 lb. per sq. in.
Tractive effort at 85 per cent. boiler pressure	63,900 lb.
Weights in working order—	
Adhesion weight	118 tons.
Weight of engine	205½ ,,
,, tender	194½ ,,
,, engine and tender	400 ,,
Tender capacities—	
Coal	24 tons.
Water	20,000 gal.

(Tons and gallons given in British measure.)

It will be noticed that the tender capacity is very high, and this is secured by designing a rectangular superstructure, in Cor-Ten steel, practically to maximum running dimensions and over 50 ft. in length; it is carried on two eight-wheel cast steel bogies, as its weight is nearly 200 tons in working order.

Notable equipment includes General Railway Signal Company's intermittent, inductive, auto-manual train control; three Thermic syphons in the firebox and one in the combustion chamber. Welding is extensively used in the boiler, combustion chamber, and firebox, and Timkin and A.S.F. roller bearings are fitted to the coupled and bogie axles, respectively.

New Coast Line Expresses

These engines will be used on the two new expresses, the Miamian, which was inaugurated on December 15, and the Florida Special which goes into service on January 2. These trains are scheduled to cover the 661 miles between Richmond and Jacksonville in 11 hr. 45 min. southbound, with two regular and two flag stops, and in 11 hr. 55 min. on the night run northbound, without any regular station stops. The Florida Special will run by night both ways without regular intermediate stops.

VICTORIA

Suburban Traffic Control

In the first month during which the new suburban traffic control—claimed to be the most modern of its kind in the world—has been in use, it has proved its potentialities in raising the standard of train running, and in abnormal traffic situations has quickly controlled them and reduced their effects of dislocation on other services to a minimum. The efficiency of the intricate mechanism of the equipment has been amply demonstrated. The system differs fundamentally from the country traffic control, as instead of reporting over the selector telephone the movements of trains, stations advise the train despatcher whenever a train is delayed for one minute or more. Any out-of-course running thus reported is marked on the despatcher's master graphs, enabling adjustments to be made, and the platform staffs to be advised in advance of intended transpositions of trains; terminal delays are, therefore, greatly reduced. From January onwards the suburban control will be extended to supervise all country goods and passenger trains running between Melbourne and outer-suburban stations.

Spirit of Progress Traffic

The actual number of passengers carried by the Spirit of Progress train during its first 12 months in service was 209,000, 15 per cent. more than its forerunner the Sydney Limited carried in the preceding 12 months. Considering the serious extent to which traffic was affected by the infantile paralysis epidemic during December, 1937, and January, 1938, this increase is the more remarkable.

Cheap Sunday Return Fares

From December 4, suburban return fares on Sundays have been reduced to little more than single fare in the Melbourne suburban area and on the electrically-worked country services. Also maximum return fares for children under 16, travelling anywhere to anywhere in these areas, are now 6d. second class and 9d. first class. Family excursion tickets at very low rates are, moreover, available for 2 adults and 4 such children from all suburban stations to certain others, such as those serving the seaside or zoo. Reductions for organised parties are also available on Sundays in these areas.

New "H" Class 4-8-4 Locomotives

To reduce the double-heading of heavy passenger trains on the western main line between Melbourne and Ararat, three "H" class 4-8-4 locomotives are being built at Newport shops and the first is to be completed by the end of 1939. These engines, which will be streamlined, will be the heaviest and most powerful in Victoria, having a tractive effort of 55,000 lb. at 85 per cent. of boiler pressure. Weight in working order will be about 261 tons including tender. They will each have three cylinders, 21½ in. dia. × 28 in. stroke, and 5 ft. 7 in. dia. coupled wheels. The boilers will incorporate welded steel fireboxes and Thermic syphons, and will carry a working pressure of 220 lb. per sq. in. Mechanical stokers will be fitted. Roller bearings will be used in the engine bogie and tender axleboxes. The tenders, carried on six-wheel bogies, will have capacities of 14,000 gal. of water and 8 tons of coal.

EIRE

Christmas Traffic

A special feature of the Christmas traffic on the Great Southern Railways last year was the large increase in the number of long distance passengers, and there can be no doubt that this was helped by the state of the weather during the week preceding Christmas, which resulted in the roads being difficult for motor vehicles. As usual many trains were duplicated, but in addition special trains which were provided were also run in duplicate and there were more special trains than in previous years.

Race Traffic

Racing traffic on the Great Southern Railways is an important item, not alone for the passengers conveyed to the race courses, but on account of the carriage of horses throughout the year. Since the advent of the private motorcar and the bus, traffic on the railway has naturally declined, especially to race meetings situated some distance from railway stations as opposed to those which have a platform beside the course. Naas, situated 21 miles by road and 23 miles by train from Dublin, is an instance of falling traffic. For every meeting held at Naas in the past, a special train has been run but as the course is over a mile from the station, and as the meeting is served by the company's own buses, it has been decided, as the result of the continued reduction in the number of rail passengers, that the train service should be withdrawn as from the January meeting.

SPAIN

Arganda Terminus, Madrid

A Decree published in the Barcelona official *Gazette* of December 10, 1938, provides for the construction of two branch lines on the eastern side of Madrid, to connect the main broad gauge lines to Saragossa and Alicante with the terminal station of the Arganda narrow-gauge railway. This is rendered necessary by the fact that the Southern

station is exposed to enemy gun-fire. It is proposed to enlarge the Arganda station and equip it so that it may serve provisionally as the Madrid terminus, while present conditions last. The general plan is a continuation of the project referred to in the Decree of May 10, 1937. The work will be carried out by the Government and the estimate is for 6,924,575 pesetas.

HOLLAND

Fire at Utrecht Central Station

The station building at Utrecht Central was partly destroyed by fire about midnight on December 17; some two-thirds of the upper storey were consumed, and considerable damage was done to the comparatively recently rebuilt and extended lower storey. Frost prevented the fire from being fought as efficiently as was wished; important records were destroyed and the district offices of the Divisional Engineer and Traffic Inspector were gutted. The large circulating and booking hall with the second class restaurant was only damaged by water, but the third class restaurant was entirely destroyed. The booking clerks remained at their posts until forced to leave hurriedly.

Owing to the fierce wind the fire continued to burn until Monday, December 19, with considerable disorganisation to the working of the station, but the staff exerted themselves to the utmost to lessen the inconvenience to the travelling public and the train service did not suffer much from it. Fortunately the roofing over the platforms remained intact and 24 hr. later all tracks were available for use again. (*See illustrations on page* 146).

Ice and Snow Troubles on Electrified Lines

Due to the unusually sudden and severe winter weather, there were, in addition to the usual troubles caused by frozen points, breakages of the overhead wires on the Central Division, causing considerable interference with the electric train service, introduced in May last. In consequence of snow difficulties with some of the newest streamlined electric trains some of the older non-streamlined stock from the Amsterdam — Rotterdam — Dordrecht line had to be used on the Central Division. The top speed being lower (100 km.-p.h. = 62 m.p.h.) than that of the newer trains (125 km.p.h. = 77½ m.p.h.) caused some late-running, and most of the trains, steam, electric, and diesel-electric, suffered delays which usually ranged from 30 min. to 1 hr., though some of the international trains were considerably later.

DENMARK

Narrow-Gauge Line Closed

The Haderslev—Vojens—Gram—Rødding line of the narrow-gauge Haderslev County Railways has now been closed to all traffic. Only the Haderslev—Over Jerstal—Toftlund line now remains of this once-extensive system, and the days of that line are also numbered. Already it has been closed for many days during the recent snowfall.

Faster Harwich-Esbjerg Service

The United Steamship Company, which works the Esbjerg—Harwich route, is reported to be considering building a new vessel for this service. It is to be slightly larger than the four present steamers, and its speed is to be 20 knots against the present 15 knots; this will enable the crossing to be reduced by 5 hr., from 23 to 18 hr.

Hirtshals-Kristianssand Service

The Hirtshals—Kristianssand steamship line, which is worked by a Norwegian company, has had several severe mishaps lately. First, the ordinary steamer lost its screw and was missing for nearly 24 hr.; being small, it had no wireless on board. A few days later the spare vessel went aground and was badly damaged, so the company has had to charter a third vessel to maintain the service.

Next summer the Nordpilen diesel express between Flensburg in Germany and the north of Jutland will be composed of four cars, motor coach, two trailers, and motor coach. It will be divided at Hjørring, the front portion going forward as now to Frederikshavn, the back part reversing along the private railway to Hirtshals where it will give a direct connection with the Kristianssand boat.

SWEDEN

State Railways Traffic Receipts

The following is a comparison between the anticipated financial positions for the current year, 1938–39 and next fiscal year, 1939–40 :—

	1938–39 Million kr.	1939–40 Million kr.
Total receipts ...	241·8	237·0
Total expenditure	207·3	203·2
Surplus ...	34·5	33·8

During the period 1934–38 goods receipts increased by about 35 per cent., but now for the first time they tend to fall again, and it is expected that even the Lapland ore traffic will be lower this year. Passenger traffic receipts also increased by some 40 per cent. during the five years ended 1937–38, but are expected to remain at the present level, thanks to improved holiday traffic as a result of holidays with pay, now compulsory.

BULGARIA

Railway Extensions

The railway system of Bulgaria has been largely extended in recent years and comprises at the present time (December, 1938) 2,344·2 route miles (3,775 km.), of which 2,024·5 miles (3,260 km.) are standard gauge lines, and 170·1 miles (274 km.) and 149·6 miles (241 km.) are narrow-gauge lines, 1 ft. 11½ in. (60 cm.), and 2 ft. 6 in. (760 mm.) respectively.

Two standard gauge lines are at present under construction, one being an extension of the Sofia—Makotzevo line eastward to Sopot. The Sopot—Karlovo—Kazanlik line has been completed, but is not yet in operation. When the section from Makotzevo to Sopot is finished a considerably shorter main-line connection than the present one *via* Plovdiv will be provided between Sofia and the important Black Sea port Burgas. The other is a mountain line between Kazilik and Chumen (Šumen) which, when completed, will form the third and easternmost north—south route, and thereby considerably improve the railway connections of Varna, the country's main port.

CHINA

Japanese Developing Whampoa Harbour

Prior to the outbreak of the present war, the Chinese Government had begun to develop Whampoa as the port of Canton; it is 10 miles below the city down the river. It was for this reason that the authorities were averse to constructing the spur line linking the Canton—Hankow with the Canton—Kowloon line in peacetime, as they thought it would divert traffic from the interior to Hong Kong in preference to Whampoa.

Now, however, the Japanese engineers are taking Whampoa in hand, and, whereas only comparatively small river craft could use it previously, there is already accommodation for three 6,000-ton vessels, and this is only the beginning of a large port scheme intended to rival or supplant Hong Kong as the principal port of South China.

GERMANY

Centenary of First Railway in Western Germany

Appropriate festivities were held in December to commemorate the centenary of the opening, on December 20, 1838, of the first railway in Western Germany, between Düsseldorf and Erkrath, part of the line to Elberfeld, which was completed throughout in September, 1841. It was built by Wiebe, who later constructed lines in East Prussia, and managed the Bromberg (now Bydgoszcz in Poland) Division of the Prussian lines. Disputes over the route to be followed led to Robert Stephenson being asked to make a report. He recommended going through Erkrath and Hochdahl, with a 1 in 30 incline between those places, on which rope haulage was used for all trains until 1927. Wiebe built a much-admired viaduct at Sonnborn which, widened in 1860, lasted until 1913. He died aged 88 in Berlin in 1892. The Düsseldorf—Elberfeld was amalgamated with neighbouring lines in 1857 and passed with them into the possession of Prussia in 1882.

XUM

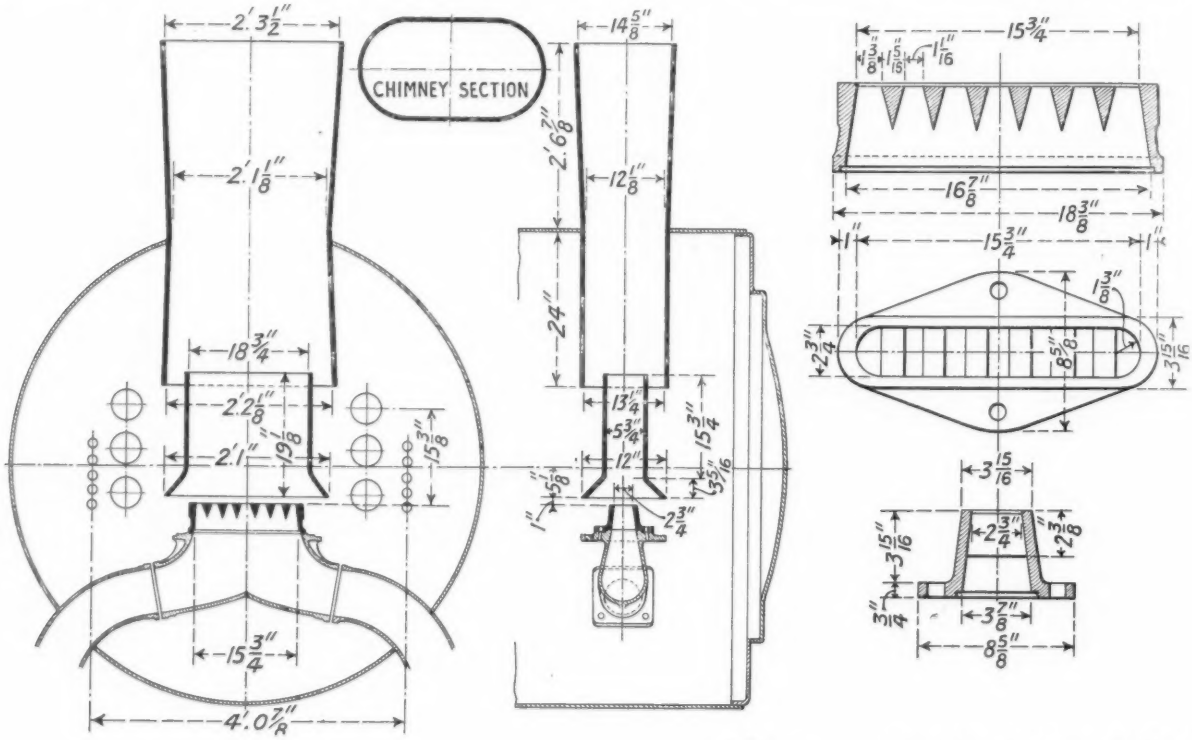
IMPROVEMENTS IN LOCOMOTIVES OF THE SYRIAN RAILWAYS

Simple modifications of the blast and the superheater have produced improved service on old locomotives

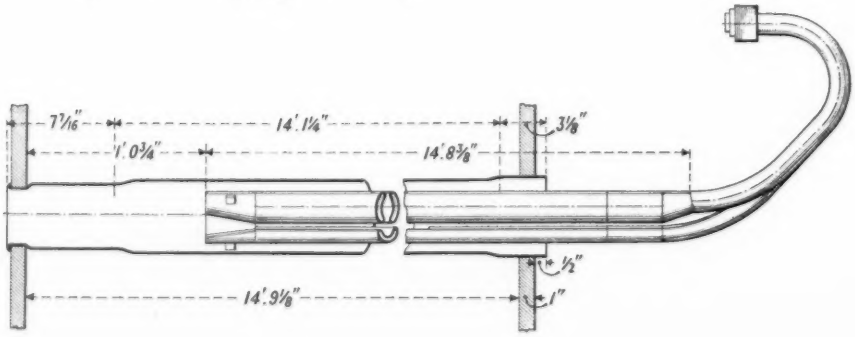
By CHARLES GODARD, Chief Engineer of the Chemin de Fer Damas-Hama & Prolongements

MOST of the locomotives of the Syrian Railways were built during the early years of the present century, and thus do not embody the various improvements that have reduced the fuel consumption and increased the tractive effort of modern locomotives. Extensive reconstruction, similar to that carried out by certain French railways, would evidently be advantageous, but this would necessitate heavy expenditure and the work involved would be rather beyond the capacity of the workshops of the Syrian Railways. It was therefore decided to restrict attention to the relatively simple and inexpensive operations of improving the blast pipe and superheating arrangements.

The desiderata to be fulfilled by the blast pipe include rapid and intimate mixture of flue gases and exhaust steam, subdivision of steam flow at the blast, minimum frictional resistance to flow, minimum back-pressure at the blast pipe nozzle, and uniform draught in all tubes and flues. These requirements are well met by the G.F. blast pipe, of rectangular form, used in conjunction with a rectangular petticoat and smoke stack as shown by the accompanying drawings (Fig. 1). The orifice of the blast pipe is subdivided by small cross-bars of triangular section, with the result that there is formed, parallel to the tube plate, a relatively thin multiple-jet curtain of steam offering a large surface to the flue gases and effecting rapid and intimate mixture therewith. In conjunction with the ejector action of the petticoat and stack, the blast pipe maintains well-equalised draught over a large area of the tube plate and thus at all parts of the firebox. The large cross section of the chimney further increases the regularity



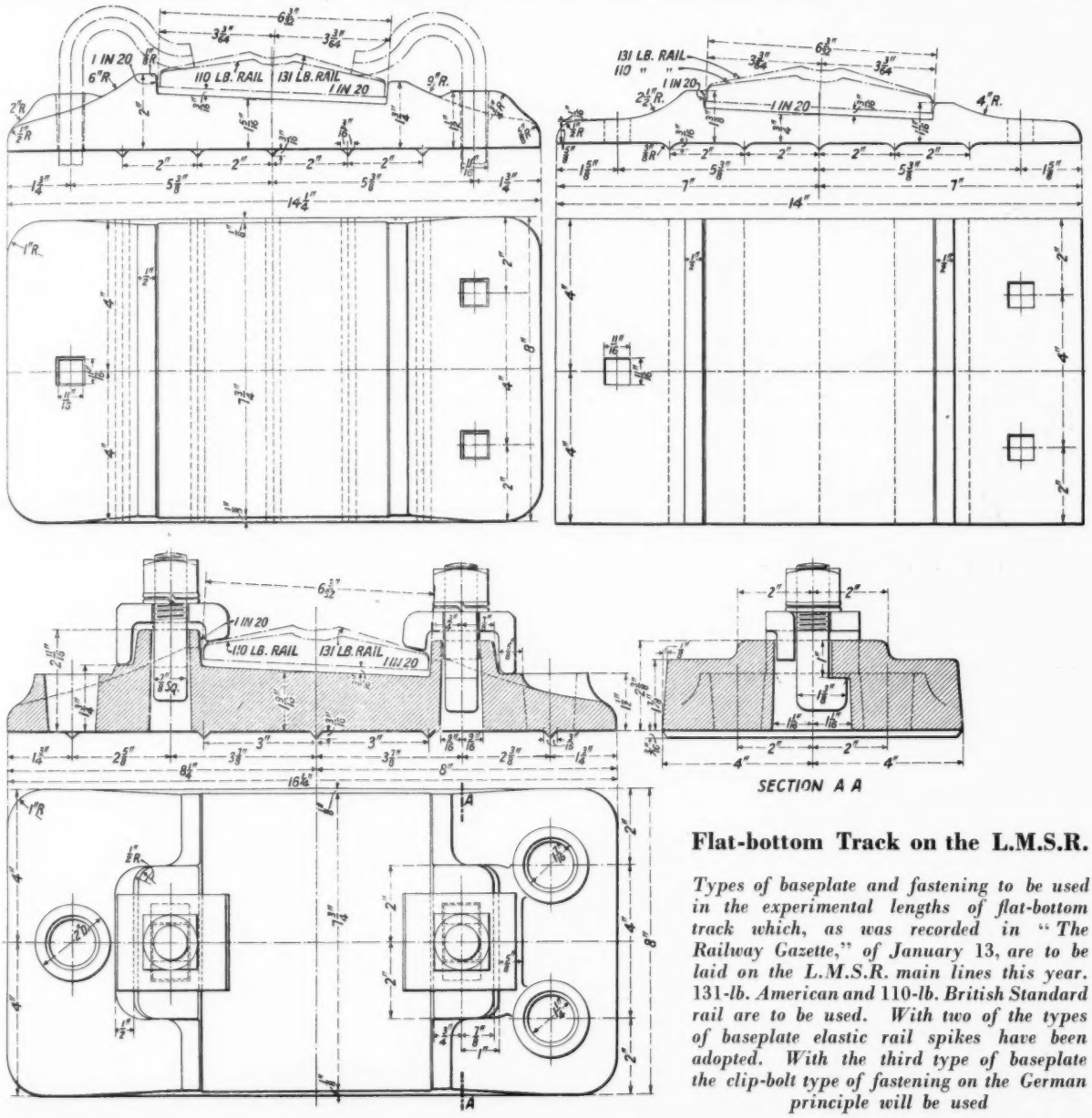
Above, Fig. 1, shows details of the G.F. exhaust arrangements



Left, Fig. 2, shows the G.F. type of superheater

of the draught. The effective cross section of the blast pipe illustrated is 131 sq. cm. (20·3 sq. in.), and the grate area of the locomotive to which it is fitted is 2·35 sq. metres (25·29 sq. ft.). Service experience with the G.F. blast pipe has been very satisfactory, the reduced pressure in the smokebox being held nearly constant and the firebox relieved of detrimental fluctuations of draught.

Another improvement, equally simple and effective, has been the replacement of Schmidt-type superheaters by G.F. superheaters, each element of which consists of three 45/50 mm. (1·772/1·969 in.) tubes flattened to the thin annular form shown in Fig. 2. Connections to the distributing and collecting headers are by 26/34 mm. (1·024/1·339 in.) circular tubes. At the firebox end, the annular tubes are connected by an annular end-box of chamfered or cut-away section combining adequate internal cross section for steam flow with minimum obstruction of the flue. The saturated steam flow is divided between the two upper tubes connected in parallel, and the superheated flow is combined at correspondingly higher velocity in the bottom tube. The advantages of this arrangement include increased heating surface and larger cross section for gas flow, compared with the Schmidt-type superheater; and rapid return of the superheated steam after passing through the end-chamber, about 350 mm. (1 ft. 1¾ in.) from the tube plate at the firebox end. Excellent results have been obtained in service during a period of over twelve months, the degree of superheat being, on the average, 75° C. (135° F.) higher than that obtained from the Schmidt-type elements. The G.F. blast pipe and superheater have been installed on various types of locomotives, and particularly on the German G.8-type 4-6-0 locomotives built during the years 1910-12. The expenditure of material and labour involved has been small, and a saving of from 10 to 15 per cent. in fuel consumption has been combined with satisfactory performance in other respects.



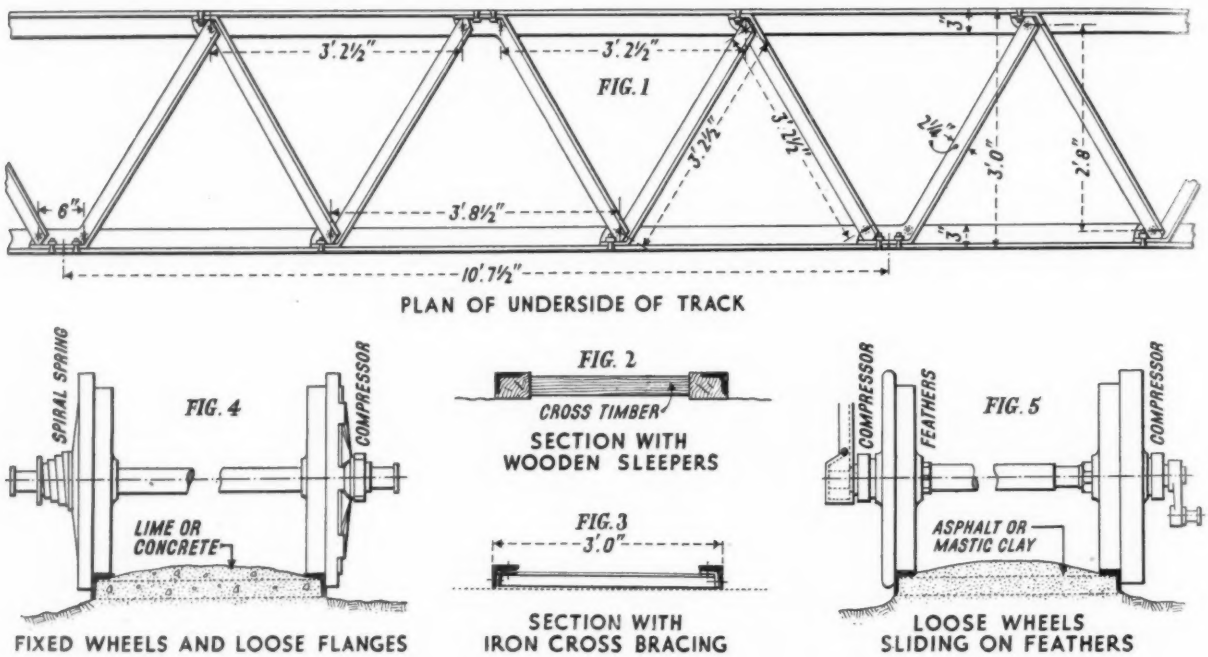
Flat-bottom Track on the L.M.S.R.

Types of baseplate and fastening to be used in the experimental lengths of flat-bottom track which, as was recorded in "The Railway Gazette," of January 13, are to be laid on the L.M.S.R. main lines this year. 131-lb. American and 110-lb. British Standard rail are to be used. With two of the types of baseplate elastic rail spikes have been adopted. With the third type of baseplate the clip-bolt type of fastening on the German principle will be used

UNUSUAL SCHEME FOR LIGHT PERMANENT WAY

A plan advanced in India in 1872 for a tramway or light railway on ordinary roads, to accommodate road-rail vehicles

FROM the dawn of public railways many schemes have been evolved by ingenious minds to enable full advantage to be taken of the benefits of rail traction, without the necessity of breaking load for final delivery. Early plateways permitted this by accommodating flat-tyred wheels, but the form of construction made efficient maintenance a costly matter. Containers were tried without much success in the first few years of goods transport on the Liverpool & Manchester Railway, and of maintaining the Lahore and Peshawar road up to its proper standard, I estimate yearly at Rs. 700 per mile. The tramway might, I think, be well constructed on an existing road at Rs. 14,000 per mile, or at a cost equal to 20 years of road repairs. The advantages in traction alone by horse or bullock power would pay for the special rolling stock and maintenance required. The wheels might be fitted with loose flanges, or broad flanges on which they could run on the ordinary roads. A portable



Details of light-railway permanent-way planned in 1872 for service in India

for the next decade or two the extensive spread of railways in most civilised countries diverted thoughts from this particular problem. Overseas, the great length of road haul from railhead in many parts resulted in various light railway, and narrow-gauge railway, schemes being mooted, and one of our correspondents in India has recently sent us details of a project of 1872 for a light tram or railroad to be laid on any ordinary road.

The following description of what might have been a connecting link between Crompton's " Government Steam Train " for common roads and India's railways of today, has been unearthed from " Professional Papers on Indian Engineering, Roorkee, 1872," to which it was contributed by Lieutenant J. A. Armstrong, R.E.

" The question of narrow gauges and light tramways having lately come a good deal again into general notice, the enclosed little project, which was laid before Colonel Strachey last year, may be useful in setting the example of opening the question at what expenditure per mile in first cost and maintenance a tramway or light railway should replace the ordinary pucka trunk roads. The cost ramp or skid, would enable them to leave, or gain the track when required. Where timber is plentiful, the longitudinal sleeper system would be adopted to carry the angle iron rail. Over sand the line might be converted into one big longitudinal sand-pot, by closing the bracing, with buckled plates or corrugated iron.

Flanges Outside the Rails

" The wheels having a sliding motion in the direction of their axles could accommodate themselves to very quick curves. The fishplate is equally strong horizontally and vertically. In this system, the wheel flanges are placed outside the rails. The rails are of angle-iron secured to each other, and partly supported by cross bracing of angle iron, which take the part of sleepers and chairs, and keep the line in gauge. The Figs. 1, 2, and 3 show the method proposed, and details of a line of 3-feet gauge with 3-inch angle iron rails, and 2¼-inch angle iron bracing: on levels a lighter bracing would probably suffice. The bracing here adopted is a single system of equilateral

triangles. The whole is put together with screw bolts fitted with square heads countersunk in the rails; the counter skids in the fish joints are lengthened to admit of expansion. There are but three patterns of ironwork in the structure.

"The line would be laid on an ordinary metalled road, the surface of which would be loosened and levelled; the filling or ballasting of the permanent way would be of rammed kunkur [*i.e.*, lime] or concrete; if these materials be not found sufficiently elastic, asphalte, or mastic cement might be used. The material used as ballasting is boxed up and cannot spread, it is hence capable of bearing a considerable pressure per unit of area, and unless the wheels of the wagons carried a very great weight, the railway would compare very favourably with the weight per unit of surface that the Lahore and Peshawar road has to carry daily in all weathers. It is not, I think, generally known, that country carts carry often 100 maunds on two wheels, which transmit all this weight to the road through an iron tyre 1¼ inch breadth. A load of double that amount, or nearly 4 tons per wheel on the 3-inch table of the tramway would hence represent the same conditions of wheel load to area. But, in the road, this pressure is not distributed over any large area by the cohesion of its substance. In the tramway the case is very different, so much so that at low velocities a layer of grass or reeds would, I think, float it on sand.

"When once laid, repairs must be reduced to a minimum, there is no woodwork to decay and the ballast cannot shift. Such a line laid on a common road would be less liable to injure cattle passing over it and to be itself injured by a cart going over it than any of the ordinary forms. The road might be most easily dismantled and reconstructed in advance, as it was replaced by the railway, although if used as a permanent line it would be probably advisable to rivet up all but the fish joints. No skilled labour would be required, except perhaps on curves, but this might be obviated by having special lengths constructed for curves of different degrees. If worked by bullock power three abreast would probably be the best arrangement.

"I now propose mentioning the special facilities that this plan would furnish to steam power over a hilly road and sharp curves. It has been before observed that the flanges of the wheels are placed outside the rails, and that the rails themselves are strongly braced together in a horizontal plane; this forms at once my track and central rail. The load is carried on the horizontal surface of the rail, the vertical edge of the rail is gripped by the wheel flange. Figs. 4 and 5 show several arrangements of loose wheels, loose flanges, &c., for effecting this object: a sliding wheel on feathers, with the flange removable for renewal, or returning, compressed in couples, would probably be the simplest arrangement; also on removal of the flange the engine could travel on common roads by its own power or otherwise."

There is no record of Lieut. Armstrong's "light tram or railroad" ever getting beyond the theoretical stage, nevertheless, it must take its place in the history of railways that might have been.

TOKEN WORKING ON VICTORIAN RAILWAYS

Special working covering varying lengths of section, &c., results in nine forms of authority to proceed from one station

THE stations on the Traralgon—Heyfield section of the Maffra branch line of the Victorian Railways are respectively Traralgon (97½ miles from Melbourne), Glengarry (103½), Toongabbie (108¼), Cowwarr (113¾), Dawson (117), and Heyfield (120½). Normally this line is worked under electric train staff rules, the sections being Traralgon—Cowwarr and Cowwarr—Heyfield. Switching instruments are provided, however, and the two local sections can be switched out to form the through section Traralgon—Heyfield. To allow the crossing of trains at certain non-electric staff stations, a special electric staff, known as the divided staff, is provided in one of the long section instruments. When withdrawn, this can be separated into two portions to form the train staffs for the new sections thus covered. These sections are then worked under train staff and ticket rules, the necessary ticket boxes being provided at the three stations. Glengarry is one of these intermediate crossing stations, and a divided staff is provided in the local section instrument at Traralgon.

Permissive Movements

To allow permissive movements over certain electric staff sections, a special electric staff known as the composite staff is provided in one of the instruments of such a section, and consists of three portions, a staff portion and ticket portions A and B. The section is then worked as a staff and ticket section until the train carrying the staff portion leaves it, when, after the reassembled staff has been inserted in the relative instrument, normal working is resumed. Such staffs are provided at Traralgon in the Traralgon—Cowwarr and Traralgon—Heyfield instruments.

Temporary telephone block posts (Glengarry and Toongabbie; and Glengarry, Toongabbie, and Cowwarr respectively) are then opened to keep the required block space interval between any two trains. Toongabbie is also opened as a block post on the Glengarry—Cowwarr divided staff section. Owing to the grade between Traralgon and Toongabbie often requiring a banking engine, a banking engine key is provided at Traralgon, controlling both the local and through section circuits.

It will thus be seen that, through this profusion of superimposed systems of safe working, a driver leaving Traralgon for the Maffra line could have one of *no fewer than nine* forms of authority to proceed:—

1. Local section electric staff (Traralgon-Cowwarr).
2. Local section electric staff (Traralgon-Cowwarr) staff portion.
3. Local section electric staff (Traralgon-Cowwarr) ticket portion.
4. Through section electric staff (Traralgon-Heyfield).
5. Through section electric staff (Traralgon-Heyfield) staff portion.
6. Through section electric staff (Traralgon-Heyfield) ticket portion.
7. Divided staff (Traralgon-Glengarry).
8. Divided staff ticket (Traralgon-Glengarry).
9. Banking engine key (Traralgon-Stop Board 98M 79C).

It is not often that so many different forms of working are seen associated within such a short distance, and the working affords an interesting example of how apparatus can be arranged to meet fluctuating traffic requirements and the precautions needed to secure safe working.

XUM

AUTOMATIC INTERLOCKING IN GERMANY*

Light signals, automatically controlled, replace manually-worked signals at level crossing between two light railways

NOT far from the town of Ziesar, in the Prussian province of Saxony, about 45 miles west of Berlin, is a level crossing between two light railways; as seen on the accompanying diagram, one of them is the normal gauge Genthin line, and the other the narrow gauge Burg District Line. Until the end of 1937 a signalman was stationed in a small hut by the crossing, to work square disc type mechanical stop signals in all four directions, those on the Burg District line being normally "off," as this was built first and was given prior right of way when the crossing was constructed later. There is also a road crossing over the railway lines, but traffic on it is so light that no precautionary measures beyond fixed warning signs have been thought necessary.

In 1936 the two railways decided, in order to save the expense of keeping a signalman on duty at this point, to instal an automatic interlocking, the first of its kind in Germany, with colour-light signals, and the work was brought into use in December, 1937. The apparatus was constructed by the Vereinigte Eisenbahn-Signalwerke, Siemensstadt, Berlin, and, save for a few minor difficulties just at the outset, has worked quite satisfactorily.

Track-circuiting is not used, the control over the signals being obtained through electric treadle rail contacts, as shown on the diagram. A colour-light signal, showing a red or a green light, is placed on each line 50 m. (54¾ yd.) from the crossing, and normally shows red. A third emergency red aspect is provided in case the others should fail. Fixed warning boards govern the approach to the light signals. At a sufficient distance in rear of the crossing the treadles are fixed, and serve to set up the necessary interlocking controls. Each lens in a signal has two lamps behind it. The ordinary red and green indications are fed from the local 220-volt d.c. electric supply, but the emergency red aspect takes its supply from a 10-volt dry battery. When a train approaches, say from Güsen, it first actuates rail contact *K3* and, provided no other movement is in progress, causes signal *S3* to show green and locks all the other signals at red. This condition remains until the first axle of the train reaches rail contact *K4*, a train's length beyond the crossing, when Signal *S3* is returned to red. The locking on the conflicting signals is then free but the apparatus does not return fully to normal until the last axle of the train has passed clear of rail contact *K4*, a slow acting relay bridging any momentary interruptions in the action of the rail contact. Any train arriving while one is passing on the other line is thus held until the latter has cleared the fouling point.

Should the local power supply fail, or one of the ordinary signal aspects burn out, the emergency red lights are switched in on all four signals, and remain until the failure is rectified, regardless of any actuation of the rail contacts. The main control is effected with the aid of interlocking relays which, with the necessary fuses, supplementary relays, lightning arresters, dry battery (600 a.h.), and other apparatus are housed in a neat casing close to the crossing. Telephone communication is also provided to the next station on one of the lines, which can in turn speak to that of the other line through the usual channels. A failure of the ordinary signal aspects or the power rings an alarm bell at a neighbouring station. Open circuit working is adopted for the rail contact circuits, and closed circuit working for the subsidiary controls.

Emergency apparatus is provided to enable the guard of a train to bring it past the crossing if a failure has occurred, in the form of a small switchboard with diagram, signal repeaters, and operating instructions. If the emergency red signal aspects are burning, the guard can extinguish the one applicable to his own train. If the green light fails to appear because the rail contact has not acted he can cause it to do so by pressing a button, provided

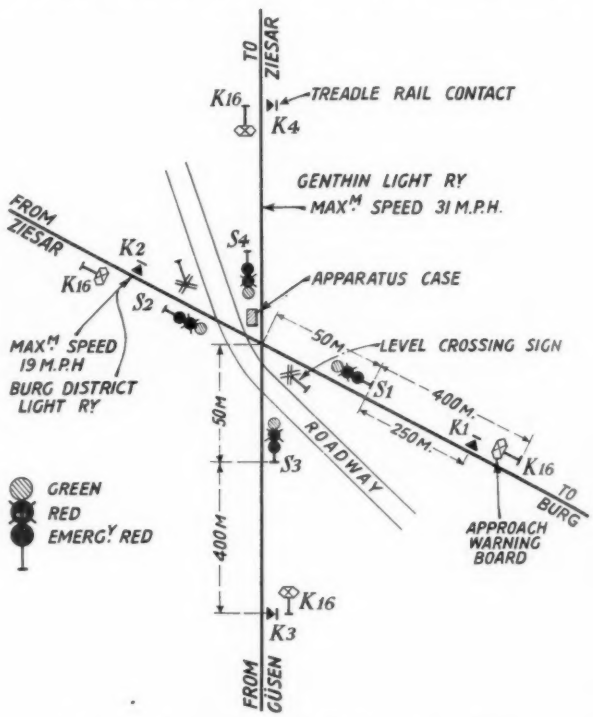


Diagram of automatic interlocking, near Ziesar, Germany

conditions are right. Partial movements, such as with permanent way lorries, can also be provided for, and the apparatus can be restored in due course to normal. The equipment is examined monthly; the red lamps are changed every six months, and the green ones yearly, as are the low-voltage emergency lamps. The maintenance is under the supervision of a neighbouring station, where the fault record book is kept.

Automatic interlocking at level crossings between two railways—or "grade crossings" as they are termed there—has been known for some time in the U.S.A., but has attracted little attention in Europe, where the number of such crossings is very small. For this reason the adoption of the principle by the Genthin and Burg light railways is of some interest.

* Particulars taken from an article by Amtsrat Winzler, Berlin, in *Zeitschrift für das gesamte Eisenbahn-Sicherungs- und Fernmeldewesen*, October 10, 1938

CLOSER LOCOMOTIVE WORKING

A review of the effects of recent working improvements and suggestions for further engine economies

By J. G. B. SAMS

THE economic ideal of locomotive working closely approximates to the routine of a ship making long voyages, namely, a regular daily mileage with a considerable continuity of service. Working conditions, although subject to what may be termed a continuous process of betterment, still call for improvement, and this is made abundantly clear by the Ministry of Transport Statistical Returns referring to locomotive operation. Taking the period 1935—1937 inclusive, the figures of train-miles per engine-hour for coaching and freight are respectively:—

	Coaching	Freight
1935	11·04	3·68
1936	11·00	3·6
1937	10·97	3·56

The above can hardly be referred to as fully satisfactory. Improvements in this respect can be contributed both from outside and inside the running-shed, but at the present state of development it would seem that the former offers the greater scope.

The history of locomotive operation within the last fifty years begins with the practice of allocating the engines to single crews, who, together with their engines, had a weekly shed-day during which they themselves washed out the boiler, swept the tubes, attended to the trimmings and adjusted or renewed the soft packings usual in valve and piston glands; the mechanical staff of fitters and boiler-makers was called in to attend to their particular work as required. At the beginning of this period it was also customary on some railways to allocate particular trains to individual crews, and a regular driver would feel himself aggrieved if he was casually booked elsewhere without a substantial cause. The advantages of this system lay in the fact that the close personal attention given to every engine kept the cost of maintenance down to a minimum, and as the locomotive of that time was comparatively inexpensive in capital cost, and, additionally, the railways had the field of transport to themselves, no account was taken of the much more numerous fleet required. Increasing demands on the locomotive department attended by rising costs brought in the practice of double-manning and finally of pooling the engines, in which any convenient engine is liable to be manned by the next crew available.

The practice of pooling has undoubtedly increased the availability of the running fleet, but has, in company with increases in weight and boiler-pressures, seriously accentuated the problems of repairs and inspections in the sheds; running practice has recently undergone considerable revision as a result, the present aim being to render the locomotive fit for extended periods of service without any intermediate repairs or attention whatever. This system requires the closest preliminary inspection and a most careful organisation of repairs during the laid-off recess, and may conceivably call for the renewal of only part-worn details on the ground that they could not be expected to last out until the next recess, and that immediate renewal would be less extravagant than stopping the engine out of turn. This recess time naturally depends upon the washing-out of the boiler—and is increased in bad-water districts—this being a process that cannot be put off. The extension of the period between washings-out becomes therefore of much greater importance. A great hindrance is found in the water used for locomotive purposes on account of its sludge and scale-forming propensities, common in greater or less degree to every source of supply. Considerable improvement has been recently effected by the provision of pre-treatment plants by the lineside, usually of the lime-soda type, in which a continuous injection of lime and soda-ash is used to bring about the necessary reactions, but a difficulty is that chemically pure water tends to cause priming, hence the experiments with continuous blowing down of a small proportion of the boiler-water on the two northern railway groups. Experience in other parts of the world has shown that priming will not occur if a very small degree of residual hardness is left in the treated water, and this may prove to be the better system in spite of its adverse effect on the internal cleanliness of the boiler.

The general effect of pre-treatment may be summed up as a tripled to quadrupled mileage between washings-out, together with the elimination of the lengthy stops between general repairs for the extraction of a number of tubes in order to allow the removal of the accumulated scale; its effect on the life of the boiler must not be overlooked, although it is not so immediate.

A reasonable corollary to extension of availability is full employment of the locomotive, and in this connection much has been achieved within the locomotive yard by the provision of ash-handling systems, rapid-coaling plants, steam soot-blowers, and power-operated turntables; these have led to material economy of time and labour, and when all the principal sheds have been brought up to date in these respects it would seem that there is but little more scope within the yard itself. Improvements outside may be looked for in alterations to train schedules, the provision of engines still more flexible in applicability, and an increased use of the small type of shunting engine. Regarding train schedules, up to the present diesel-engined vehicles appear to have enjoyed a certain amount of advantage as in most cases special workings, giving fairly steady employment, have been got out for them, and they have not been used as units of a link of similarly-powered engines with the possibilities of casual employment, traffic delays, and waits between trains common to the ordinary steam service. The suggestion is made that by working along similar lines steam locomotive operation might be considerably improved. While it is impossible for many reasons to alter the times of many freight as well as passenger trains, there must still be a large proportion open to adjustment in favour of a greater continuity of locomotive working, the underlying idea being to hold an outgoing train back or so to adjust terminal working that it becomes unnecessary to bring a fresh engine out of the shed, this suggestion being particularly applicable to the early part of the day. If, for example, in the case of bays at both ends of a junction station, the terminating trains were run through the station and backed in at the further end instead of running into the nearer one and so locking up the engine, many turn-over engines would be avoided and in addition much movement of the released engines about the yard, as they have to go somewhere on release.

The more versatile type of engine already referred to

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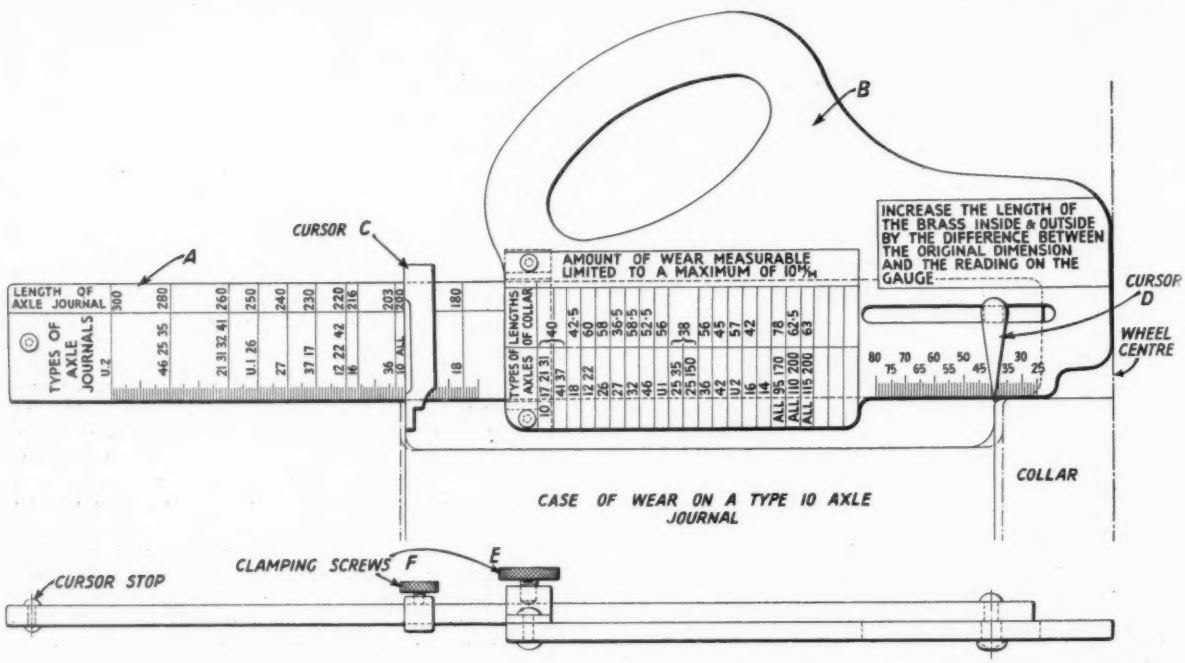
should be competent to deal with express passenger as well as freight trains. A dual purpose design of this nature envisages the use of a two-speed locomotive with a moderate diameter of driving wheels, the power unit being connected to the driving axle through one of the two trains of gearing; this is not so revolutionary as it may appear if, once more, diesel railway practice is borne in mind. The final suggestion is the increased provision of small " one-man " type shunting engines to relieve the road engines of this work at the more important roadside stations and yards. A good road engine is necessarily a poor shunting engine, and to hold up a freight train in order to shunt out a yard does not always seem sound economics; bearing in mind the relative costs of each type of engine, it may be laid down that if the yard shunting by road engines exceeds an average of three hours daily in any one yard there is a case for the use of a small shunter. An examination of the proportion of travelling to shunting (not shunted) time in connection with many freight trains would prove interesting and informative reading; unfortunately these figures are not always accessible to the locomotive running department.

MEASURING LONGITUDINAL WEAR ON JOURNALS

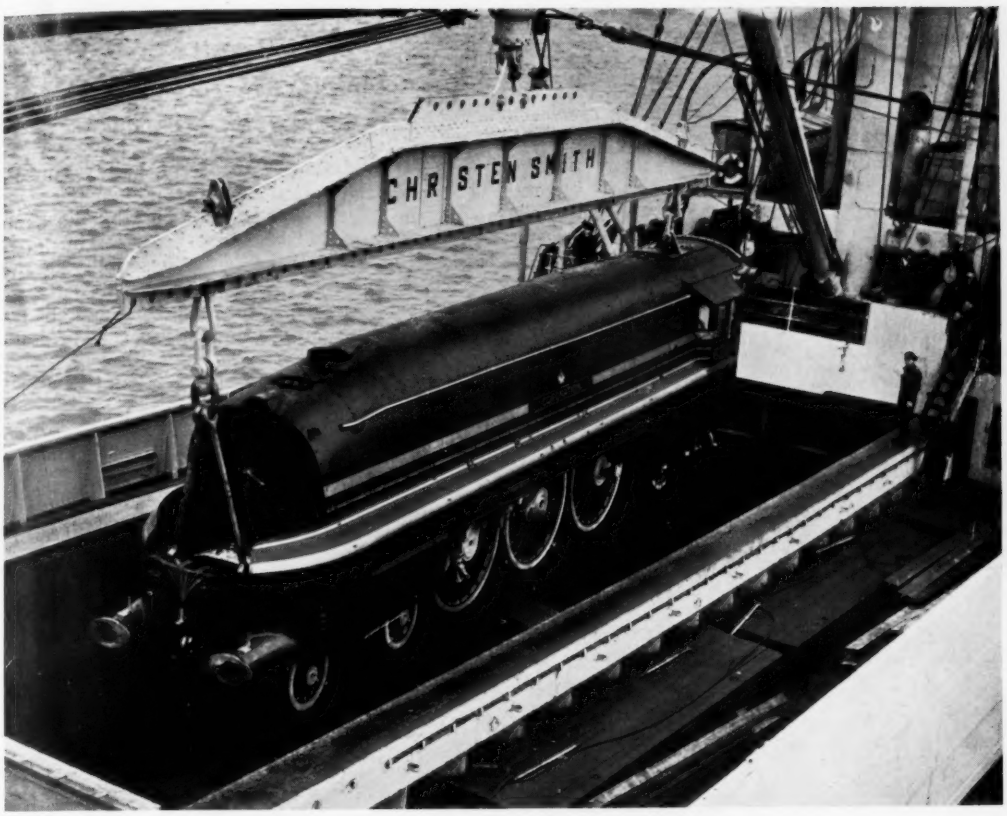
Ingenious gauge in use on the French National Railways

A GAUGE which permits the longitudinal wear on the journals of railway carriage axles to be measured, has been devised at the shops of the former P.O.-Midi Railways (now South-Western Region, French National Railways). It is designed so that a comparison of the standard with the actual dimensions is easily possible, the difference between the two representing the amount of wear. It consists of a metal rule *A* (see diagram) marked off in millimetres, on which the standard lengths of the various types of journals are marked. Two slides move along this rule, one of them *B* being a large metal piece provided with a handle which permits the apparatus to be manipulated. Along this slide a series of marks is provided indicating the various lengths of wheel seats. An indicator *D* is fixed in such a way on the rule that it moves along the scale indicated on the slide *B*, permitting the position of the slide to be regulated as desired for measuring. A thumb screw *E* at the back of the rule allows this slide to be fixed in any desired position. The second slide, *C*, is a small one and can also be fixed in position by a thumbscrew *F*. It runs along the scale on the rule and indicates the length of the journal.

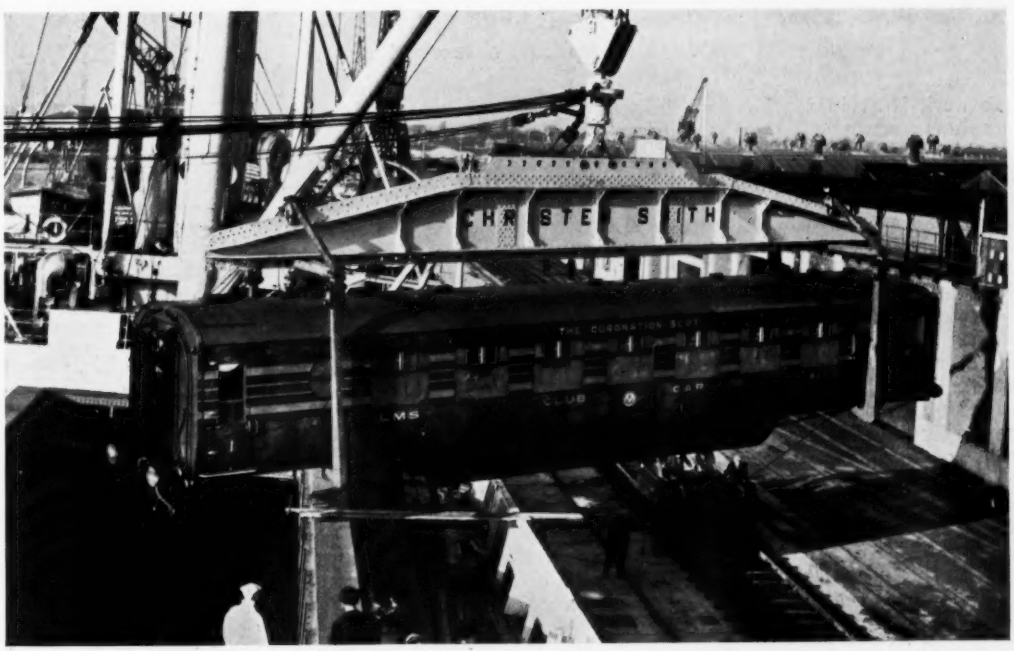
In use, the large slide *B* is moved so that the indicator on the rule *A* marks the length of the wheel seat. The small slide *C* is moved to the position indicated on the rule as being the standard length for the type of journal to be measured. The apparatus is then placed against the journal, with the end of the large slide *B* against the wheel. The indicator *D* will then show the position of one end of the journal, and the small slide *E* the position of the other end. If there has been any wear, this can be measured by moving the large slide *B* so that the indicator *D* on the rule *A* will mark the true position of the end of the journal. The difference between the original position and the new position indicates the amount of wear at this end. The slide at the other end of the rule is then moved until it is in line with the other end of the journal. The amount of this movement indicates the total wear at both ends. The wear at this end can be obtained by subtracting the wear at the wheel end from the total wear.


B
CURSOR C
A
INCREASE THE LENGTH OF THE BRASS INSIDE & OUTSIDE BY THE DIFFERENCE BETWEEN THE ORIGINAL DIMENSION AND THE READING ON THE GAUGE
AMOUNT OF WEAR MEASURABLE LIMITED TO A MAXIMUM OF 10 M/M
CURSOR D
WHEEL CENTRE
COLLAR
CASE OF WEAR ON A TYPE 10 AXLE JOURNAL
CLAMPING SCREWS F
E
CURSOR STOP

Gauge for measuring longitudinal wear on journals



Lowering the L.M.S.R. locomotive "Coronation" into the hold of the "Belpamela" on January 20. It will be noticed that the front-end streamline casing has been removed to facilitate slinging

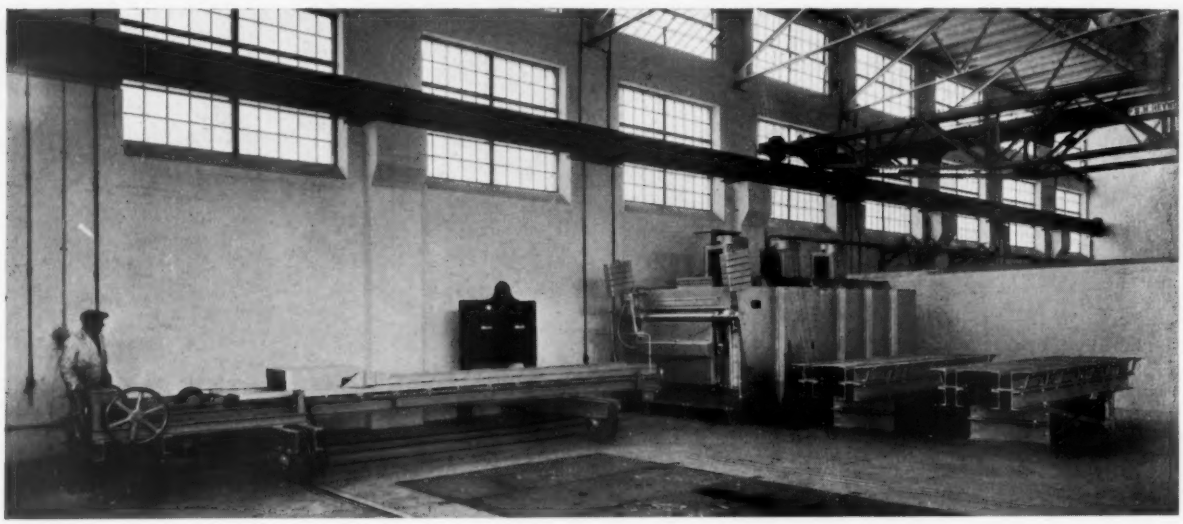


One of the carriages (without bogies) of the Coronation Scot train being hoisted on board the "Belpamela" at Southampton Docks on January 19. The vessel sailed yesterday (January 26) for the U.S.A., where the train is being exhibited at the New York World's Fair

FURNACE INSTALLATIONS IN RAILWAY SHOPS

Some details concerning electrically-operated types

ALTHOUGH for the most part furnaces in railway shops are either gas-fired or fed with pulverised coal, with some cases in which oil fuel is used, it may appear on investigation that a strong case can be made out for the electrically-operated type of furnace. Electric furnaces are available for both heat treatment and melting. Dealing first with the resistance type furnace for heat treatment purposes, it is claimed that a more uniform temperature distribution is obtained, and this ensures the same treatment for every part of the charge, whilst distortion of the work is avoided. Further, the temperatures can be accurately controlled, thus enabling the highest physical properties to be realised in the product. There are numerous other claims, as, for instance, economy of operation as compared with other systems, and also lower maintenance costs, whilst the amount of labour required is less, due to the completely automatic operation of the electrical furnace, and the readiness with which it can be brought into use without the attendance of an operator.



Birlec Batch-type heat treatment furnace with charging machine

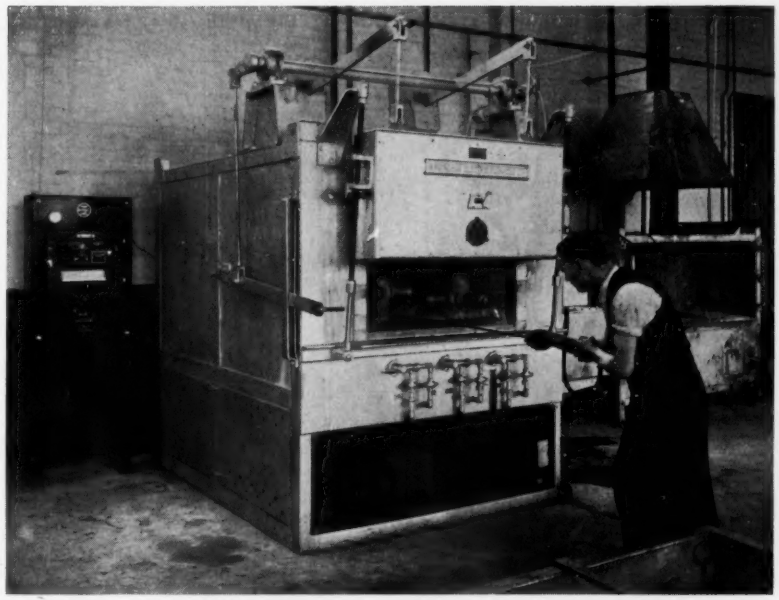
Since the average railway workshop, owing to the nature of its work, is not laid out for quantity production, at any rate in the heavier classes of product, it is generally desirable that one type of furnace shall be suitable for, say, annealing steel castings, hardening alloy steel parts, carburising, tempering, and so on, and for such a wide range of operations an ordinary box type furnace is generally the most convenient, and this may or may not be equipped with mechanical charging and discharging devices. In many cases it is more convenient to instal a battery of relatively small furnaces, so that each can if necessary be used for a different purpose. In cases where there is a sufficient quantity of work to justify the installation of a furnace specially assigned to deal with it, many variations on the ordinary box type design may be considered, with a view to more convenient handling of the work. For instance, the bogie hearth type furnace is often used for large forgings, and for the hardening and tempering of such parts as straight and crank axles, connecting rods, alloy steel bars, and other items. In this case the charge can be lowered on to the bogie by the shop crane, and then moved into the furnace either by hand or by electrical mechanism, thus greatly simplifying the handling of bulky or heavy articles.

The Birlec bogie hearth furnaces, manufactured by Birmingham Electric Furnaces Limited, are employed up to 30 ft. long by 4 ft. wide for dealing with charges up to 25 tons or greater. These equipments usually have the heating elements subdivided into a number of separate sections, each of which is individually controlled by an automatic regulator to ensure the utmost uniformity of temperature distribution throughout the chamber, and it is significant that work treated with such equipment shows no discernible variation in physical properties between any two points. Another specialised type of furnace which can be used for connecting rods and other long parts which are conveniently treated in a vertical position, is the cylindrical pit type. A group of parts may be suspended from a heat-resisting steel spider or supported in some form of jig, the feature of this arrangement being the ease with which a load is transferred from the furnace to the quenching tank in hardening operations by means of the overhead crane.

Where, as is usually the case, a large number of tools is in use and the tool-room is consequently laid out on a generous scale, it is generally preferable to carry out the heat treatment of all tools and dies on the plant. In this direction the electric furnace has a special application, in that the scale-free hardening of both alloy steel and high-speed steel tools can be carried out with certainty by the use of a non-oxidising furnace atmosphere. For tempering hardened tools and for the secondary heat treatment of high-speed steel, a special type of electric furnace is available from the Birlec range, this having a powerful motor-driven fan to accelerate the convection currents in

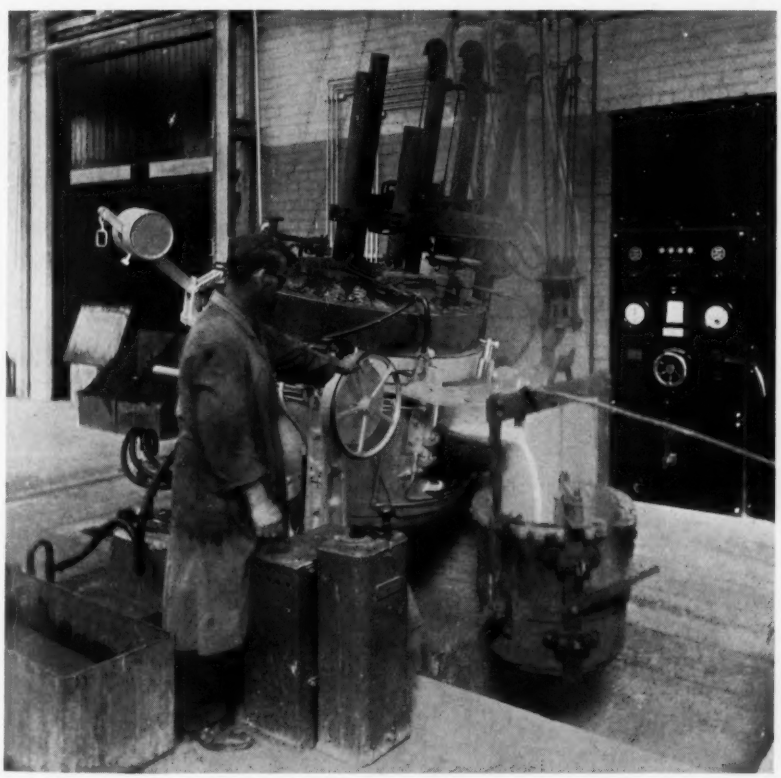
the chamber. Emphasis may be laid upon the patented charge progress recorder with which these furnaces are fitted. This instrument records the exact heating time for each charge, which cannot be estimated by any other means. When treating varying loads, therefore, a maximum rate of production can be maintained by avoiding unnecessarily long heating. Another type of electric furnace for tool-room use is the salt-bath type for high-speed steel hardening. This is an alternative to the controlled atmosphere furnace, and has the same virtue of eliminating scaling and decarburisation. It is mainly suitable for dealing with comparatively heavy cutters and other tools, and for a given size will allow of a considerably greater output of work per hour than the alternative type.

The advantages of electric heating can be applied to many types of work in addition to the common heat treatment operations above referred to, as for instance, annealing the ends of tubes prior to swaging or expanding, for melting and holding white metal for bearings, and for tempering different types of springs.



Birlec Batch-type furnace for hardening alloy steels and reheating carburised parts

The electric arc furnace is recognised as virtually the standard type of equipment for melting alloy steel for making castings. It is, however, less widely appreciated that this type offers advantages when used in iron and brass foundries. These include a higher rate of output for a given size, reduction in oxidation losses, accurate control of analysis, more easily controlled pouring temperature, and higher superheating temperature available for iron. Here again, as compared with the fuel-fired type, there is said to be greater economy in working, and a further important point is that the electric furnace can be installed anywhere in the works with equal facility and convenience.

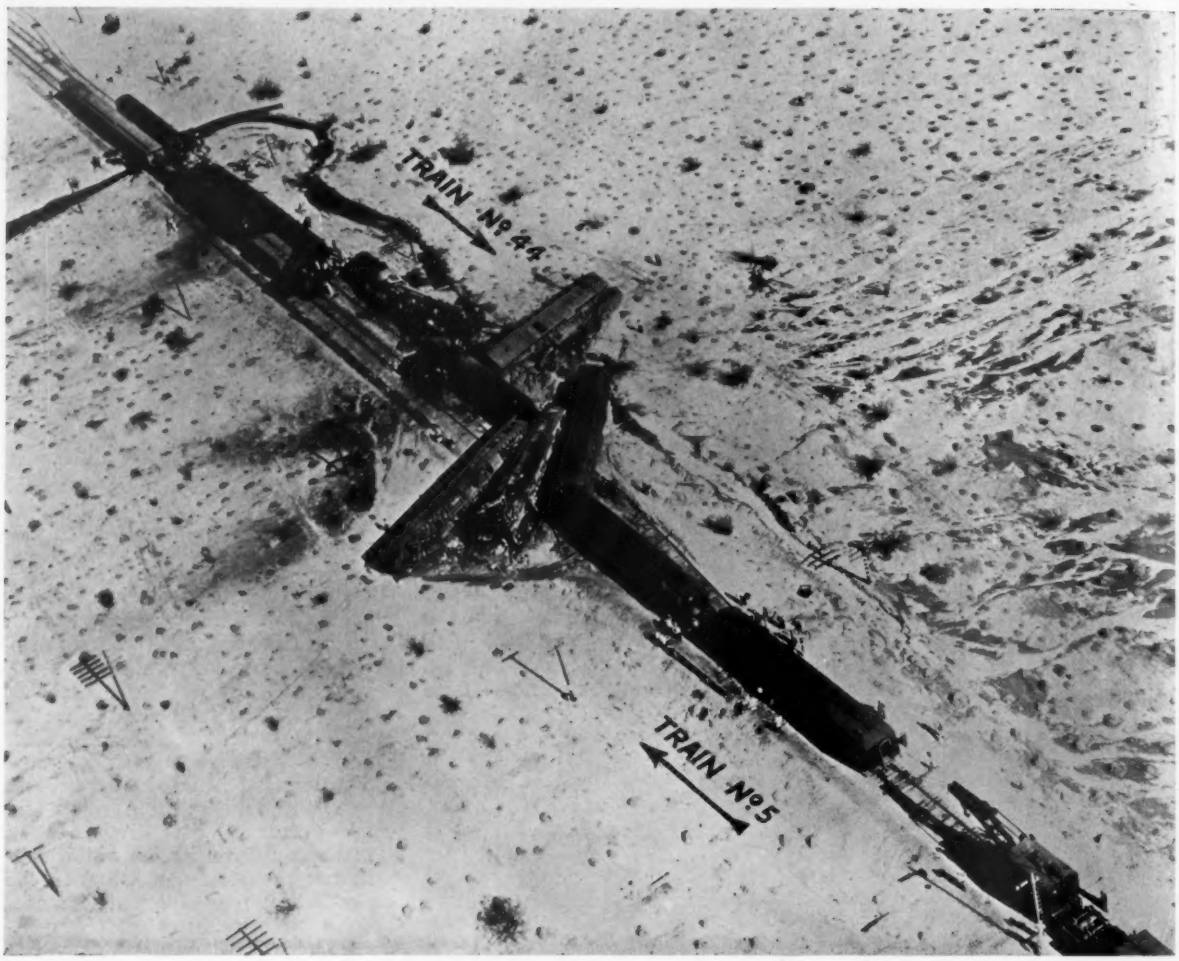


Birlec-Lectromelt 15-*cwt. arc furnace for making steel castings*

During our investigation of this subject, our attention was called to the Birlec-Detroit type of electric furnace, which comes into the category of melting furnaces. The advantage of this type for the iron foundry is its ability to superheat the metal to a considerable degree under close control, thus enabling intricate castings to be poured easily and the highest possible physical properties to be obtained. In both the iron and brass foundry, the high rate of melting from this type of furnace enables different compositions to be run in rapid succession if desired, while further, the thorough mixing of the charge which results from the rocking action of the chamber is specially important in connection with the new lead-bronze alloys, all segregation being avoided. These furnaces are well suited to the repairing workshop, where a replacement casting in iron, bronze, brass or even steel may be called for at short notice. A type of furnace which is widely used for producing steel castings of considerable size is also included in the output range of Birmingham Electric Furnaces Limited.

Collision between all-steel expresses at Tortuga, Southern Pacific Railroad

(*See editorial on page* 125, *and article on page* 150)



Aerial view of wreckage after the collision

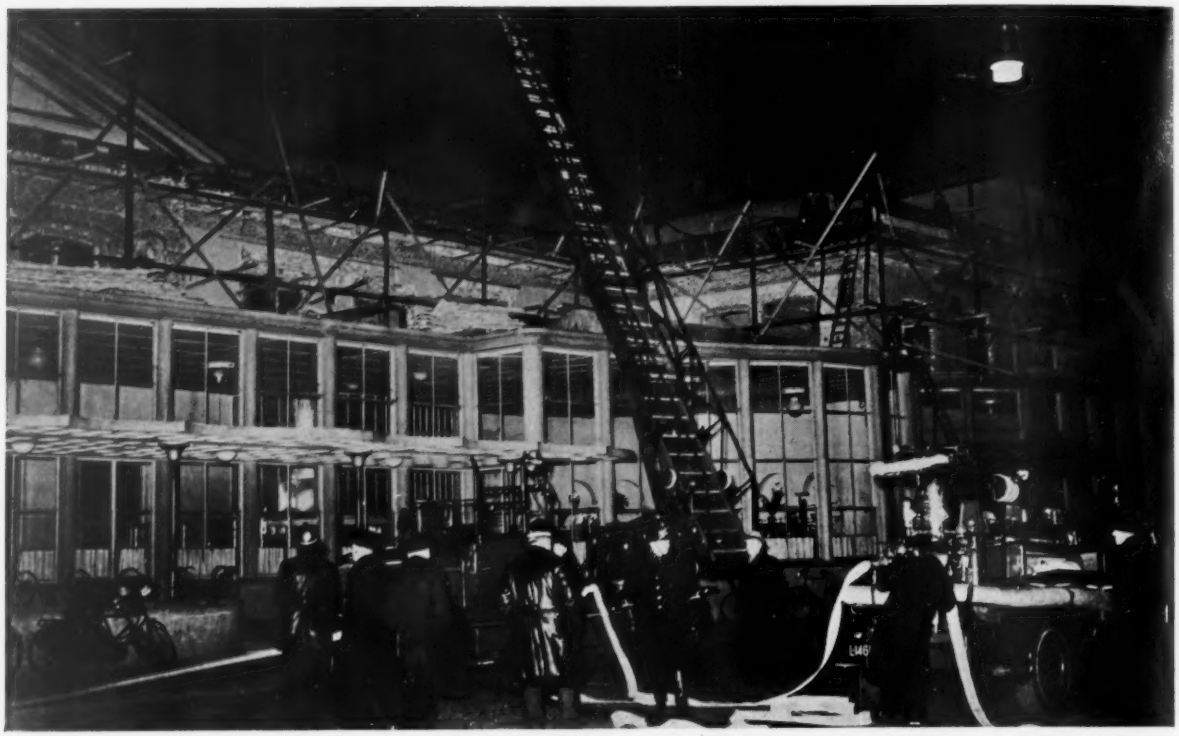
Looking westward, showing east switch and main track slewed to clear wreckage

Looking eastward at wrecked locomotives. No. 4362 (*Train No.* 5) *on right*

Above : The wrecked locomotives as they came to rest. No. 4304 (*Train No.* 44) *on left*

Smashed end of lightweight chair car of Train No. 5. *This was fifth from the engine*

Leading end of second baggage car of Train No. 5 *after removal to siding*



Above: General view of the station buildings from the road approach, showing how severely the older upper storey has been damaged, while the new lower part is practically intact

Right: Damage to the platform side of the building and station roofing; note the masses of icicles, caused by the fire fighting, and snow on the platform

FIRE AT UTRECHT STATION, HOLLAND

(*See page* 133)

RAILWAY NEWS SECTION

PERSONAL

Mr. A. W. Bolden, Chairman of the Antofagasta (Chili) & Bolivia Railway Company Limited, and of the Nitrate Railways Co. Ltd., has been awarded the Chilean Order of Merit, with the rank of Commander.

Mr. A. J. Clarkson, Assistant to the District Goods & Dock Manager, L.N.E.R., West Hartlepool, has been appointed Traffic Manager at the Tyne Improvement Commissioners' docks and coal shipping staiths. Mr. Clarkson, who is 35, began his career with the L.N.E.R. Company as a traffic apprentice, and has held various positions with the company at Hornsea, Bradford, King's Cross, Hull, and West Hartlepool. He has occupied his present position since 1936.

From *The London Gazette* of January 20: Regular Army Supplementary Reserve of Officers, Royal Engineers, Transportation:—

Captain R. Thompson to be Major (December 17).

Lieutenant E. L. Triffitt to be Captain (December 17).

Second-Lieutenant W. J. Hartnell to be Lieutenant (December 18).

Mr. F. G. Wainwright, whose retirement from the post of Divisional Superintendent, Cardiff, G.W.R., was recorded in our issue of December 23, was entertained to a complimentary dinner at the Park Hotel, Cardiff, on January 14. The Lord Mayor of Cardiff presided, and presented Mr. Wainwright with a clock on behalf of the gathering, among which were representatives of civic and trading interests, and of railway staff.

Mr. V. E. Bridgen has been appointed Manager of the Commercial Transport Department of Rootes Limited.

Mr. Erawwala Acharigo Martin Singho, Minor Supervisor, Mechanical Engineer's Department, Ceylon Government Railway, was awarded the Imperial Service Medal in the New Year Honours List.

We regret to note the recent death, at the age of 90, of Mr. T. H. Woodroffe, who retired from the position of Chief Mechanical Engineer, Victorian Government Railways in 1913. He joined the service as an apprentice in 1861.

Mr. J. C. Highet, F.C.H., A.M.Inst.C.E., Member of the Indian Railway Board, who, as announced in THE RAILWAY GAZETTE of December 30, has proceeded on leave preparatory to retirement, was born in 1884. He went out to India from the Royal Indian Engineering College, Coopers Hill—where he was one of the top men of his year and was awarded a Fellowship of Coopers Hill—as an Assistant Engineer on the State Railways in 1905. He gained valuable experience on open line and construction works and also upon the Kashmir railway surveys in that grade. In 1910 he became Personal Assistant to the Manager of the Oudh & Rohilkhand Railway. Promoted Executive Engineer in 1914, he subsequently held the following posts: Assistant Secretary, Railway Board, and Munitions Board, of which he afterwards became Controller of Railway Materials; Secretary, Indian Stores Purchase Committee; and Assistant Agent of the North Western Railway. Mr. Highet officiated as Deputy Agent between 1923 and 1926, then being appointed Secretary to the Railway Board. Subsequently he became Director of Establishment with the board. He officiated as Agent (now General Manager), N.W.R., for six months during 1931 prior to his confirmation in that post in 1932. He was elected President of the Indian Railway Conference Association for 1935-36. In March of the latter year Mr. Highet was appointed Member of the Railway Board, the position from which he proceeded on leave preparatory to retirement on December 7. He is an Associate Member of the Institution of Civil Engineers.

Mr. J. C. Highet, F.C.H.
Member, Indian Railway Board, 1936-38

INDIAN RAILWAY STAFF CHANGES

Mr. C. F. Gilbert has been confirmed as Divisional Superintendent, E.I.R.

Mr. D. H. Hewitt has been appointed (provisionally permanent) Deputy Chief Mechanical Engineer, G.I.P.R., as from November 7 last. He has also been granted five months' leave from that date.

Mr. E. E. Jones, Bridge Engineer, E.B.R., has been permitted to retire from Government service as from November 23 last.

Mr. T. McIntyre has been promoted (permanently) to be Bridge Engineer in place of Mr. Jones, as from that date.

Lt.-Colonel C. E. Chase, V.D., Chief Mechanical Engineer, B.N.R., proceeded on leave preparatory to retirement on December 1.

Mr. A. M. Robertson has been appointed to succeed Lt.-Colonel Chase as Chief Mechanical Engineer, B.N.R., as from December 1.

Mr. W. Hood, Deputy Chief Engineer, Bridges, G.I.P.R., has been appointed to officiate as Deputy Controller of Standardisation (Civil).

Mr. C. H. Griffiths, Signal Engineer, E.B.R., has been permitted to retire from Government service as from November 11.

Mr. H. A. Tuck has been appointed to officiate as Deputy Chief Engineer, Signals, N.W.R.

On reversion from the post of Senior Government Inspector of Railways, Circle No. 2, Mr. K. B. Lal Mathur has been appointed Deputy Chief Engineer, E.I.R., as from October 11.

On return from leave, Rai Bahadur N. C. Ghosh has been posted as Divisional Superintendent, E.I.R., as from October 12.

Mr. T. W. Brown, whose appointment as Chief of the Central Materials Inspection Bureau, Derby, L.M.S.R., was recorded in our issue of December 9, began his career with the former London & North Western Railway as

Mr. T. W. Brown

Appointed Chief of Central Materials Inspection Bureau, Derby, L.M.S.R.

a premium apprentice at Crewe in 1905. During his training period he attended the Technical College at Crewe, and the Manchester School of Technology. After passing through all the shops at Crewe, Mr. Brown joined the Midland Railway, with which he served until returning to the L.N.W.R. in the Testing Department at Crewe in 1920. When the Central Materials Inspection Bureau was established under L.M.S.R. auspices in 1928, Mr. Brown was appointed Assistant in charge of the Crewe District, from which position he has now been promoted.

Mr. W. H. Waugh, whose retirement on January 20 from the position of Assistant District Goods Manager, Hull, L.N.E.R., was announced in our issue of January 13, entered the service of the North Eastern Railway in 1890 as a clerk at a roadside station. In 1892 he was transferred to the District Goods Manager's Office, Newcastle, being in 1911 appointed Chief of the Rates Section in the District Goods Manager's Office at Newcastle, after serving in various departments of that office, and in 1913 became chief of the Staff Section. In June, 1917, he was transferred to Hull as Chief Rail Clerk in the Divisional Goods Manager's Office, and in January, 1921, was appointed Chief Clerk in the Dock Section of that office. In January, 1923, Mr. Waugh was appointed Docks Assistant to the Divisional Goods Manager, Hull. He was appointed Dock Superintendent at the Western Docks, Hull, in 1927, and in 1929 was transferred to the position from which he is now retiring.

Mr. W. H. Waugh

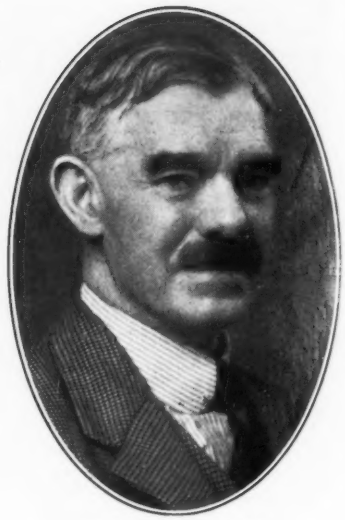
Assistant District Goods Manager, Hull, L.N.E.R., 1929-39

Mr. A. J. Rice, who, as recorded in our issue of January 6, has been appointed Assistant (Rates Tribunal) to the Chief Commercial Manager, L.M.S.R., entered the service of the former London & North Western Railway at Broad Street goods station in 1906. After gaining experience in various sections of the Goods Agent's office there for two years, he was transferred to the office of the District Traffic Superintendent at Broad Street. In 1912 Mr. Rice was appointed to the Advertising Department of the General Manager's office, Euston, where he remained until the outbreak of the great war. Mr. Rice then enlisted in the 13th Battalion, London Regiment, and was later gazetted to the East Surrey Regiment, serving on the Western and Balkan fronts. In March, 1918, he was seconded to the Royal Engineers for railway service in Macedonia, and later on the Bulgarian and Anatolian railways. He was demobilised in December, 1919, with rank of Captain. Mr. Rice returned to railway service in the Chief Goods Manager's office, L.N.W.R. In May, 1927, he was appointed Chief Clerk (Personal and General) to the Chief Goods Manager, L.M.S.R., and continued in the same position under the Chief Commercial Manager from 1932 to 1935. In August, 1935, Mr. Rice was appointed Assistant (Rates Section), and continued in that position until his recent appointment as Assistant (Rates Tribunal) to the Chief Commercial Manager.

Mr. A. J. Rice

Appointed Assistant (Rates Tribunal) to Chief Commercial Manager, L.M.S.R.

Mr. F. Giffard Cole, M.I.E.E., retired on January 31 from the position of Technical Assistant to the Electrical



Mr F. Giffard Cole

Technical Assistant to Electrical Engineer, Southern Railway, 1924-39

Mr. W. L. Kelly

Appointed Assistant District Goods Manager, Hull, L.N.E.R.

Engineer, Southern Railway (see our issue of January 6). Mr. Cole received his mechanical and electrical training as a pupil at the Victoria Works (Lambeth), of the Anglo-American Brush Company and, when that company was re-formed as the Brush Electrical Engineering Company, transferred to the Falcon Engine Works at Loughborough, Leicestershire, which shortly afterwards developed into the present establishment of the latter company. In 1890 Mr. Cole returned to Victoria Works and, after a term of service under Mr. John S. Raworth, then Chief Engineer to the Brush Company, joined the staff of the Great Northern Railway Company in 1894, as Assistant Electrical Engineer, relinquishing that position in 1906 to become Resident Engineer for the London Brighton & South Coast Railway single-phase overhead conductor electrification schemes, which were adopted and put in hand on the advice of Sir (then Mr.) Philip Dawson, the company's Consulting Electrical Engineer, in that year. In 1924, after the railway amalgamation and the adoption by the Southern group of the low-tension direct current conductor rail system as its standard form of electrification, Mr. Cole was appointed to the office from which he has now retired, under Mr. Herbert Jones, and for a short period under Mr. Alfred Raworth, son of his former chief. Mr. Cole's connection with railways has extended to upwards of 44 years, 32 of which have been concerned with the developments of electric traction on the Southern Railway lines, about 650 route-miles (or 1,640 single track-miles) of which have now been equipped and brought into use for operation of electric trains.

Mr. W. L. Kelly, whose appointment to succeed Mr. W. H. Waugh as Assistant District Goods Manager, Hull, L.N.E.R., was recorded in our issue of January 13, was educated at King William's College, Isle of Man. From there he went to Peterhouse, Cambridge, where he gained a Classical Exhibition. In 1928 he joined the L.N.E.R. as a Traffic Apprentice, and in 1931 was transferred to the Passenger Manager's Office (Southern Area) at Liverpool Street. Here, during the organisation of work in connection with the Road Traffic Act, 1930, and the Standing Joint Committees of Associated Companies, he was attached to the Road Transport Section. In this department he was connected also with the Excursion Section, and the Pooling Section formed in 1932 after the pooling agreements with the L.M.S.R. and G.W.R. In June, 1933, Mr. Kelly took charge of the first two Northern Belle train cruises, and in 1934 he became Assistant to the District Passenger Manager, Manchester. Three years later he went to the Passenger Manager's Office (N.E. Area), York, as Head of the Development Section, in which position he has remained until now.

We regret to record the death on January 9 of Alderman George R. Young, J.P., late Managing Director of the Darlington Railway Plant & Foundry Co. Ltd.

Sir Ronald Matthews, Chairman of the L.N.E.R., is to succeed as Chairman of General Refractories Limited Mr. Frank S. Russell, who will retain his seat on the board. Sir Ronald is at present Vice-Chairman of this company.

We regret to record the death on January 21 of Mr. James T. Hodgson, M.I.Mech.E., formerly Chief Engineer and Superintendent of Works, Municipal College of Technology, Manchester, and President of the Railway Locomotivemen's Craft Guild, Manchester and District. Mr. Hodgson was joint author, with the late Mr. John Williams, of "Locomotive Management from Cleaning to Driving," a new edition of which, revised by Mr. Chas. S. Lake, has just been published.

Retirement of Mr. C. S. Louch

At a recent meeting of the railway companies' accountants, the opportunity was taken of bidding an official farewell to Mr. C. S. Louch, having regard to his impending retirement from the position of Comptroller and Accountant of the London Passenger Transport Board. In asking Mr. Louch to accept from his colleagues the gift of a salad bowl and servers with cups and spoons in silver and jade green glass, Mr. A. Howie (Southern Railway) on behalf of the accountants, expressed regret that the passing of time had brought with it the official severance of Mr. Louch from his many railway friends, who would always retain happy recollections of his many and outstanding qualities which had endeared him to all his colleagues of the main-line companies. Each of the accountants paid personal tribute to Mr. Louch, and all expressed the hope that a retirement so well-earned would afford many years of happiness, health, and leisure both to him and his wife. Mr. Louch, in thanking the accountants for their gift, stated that he felt somewhat embarrassed by the many kind expressions which had been made, but it was a great pleasure to know that in his retirement he carried with him the good wishes of all his colleagues.

G.N.R. (Ireland) Appointments

The Rt. Hon. Lord Glenavy has been elected Chairman of the Great Northern Railway Company (Ireland) in place of the late Mr. W. B. Carson.

Mr. J. B. Stephens, having retired from the position of General Manager has been co-opted a member of the board.

Sir George E. Clark, Bart., and Mr. J. B. Stephens have been elected Deputy-Chairmen.

Mr. G. B. Howden has been appointed General Manager in the place of Mr. Stephens.

Funeral of Mr. W. Challis

The funeral of the late Mr. W. Challis, Chief Assistant to the Assistant Engineer (Signals and Telegraphs), Southern Railway, whose death on January 17 was recorded last week, took place at Norwood Crematorium on January 21. In addition to the family mourners and the large number of personal friends who attended, the following were among those present :—

Southern Railway : Messrs. A. E. Usherwood (representing Mr. Gilbert S. Szlumper, General Manager, and Mr. G. Ellson, Chief Engineer), R. M. T. Richards (representing Mr. E. J. Missenden, Traffic Manager), W. J. England (representing Mr. H. E. O. Wheeler, Superintendent of Operation), D. R. Bennett, Electrification Assistant ; E. Greenhalgh, Outdoor Machinery Assistant ; A. Cunnington, Assistant for Lighting, Heating, &c. ; J. E. Sharpe, London (West) Divisional Superintendent ; P. Nunn, London (East) Divisional Superintendent; H. I. Bond, London (West) Divisional Engineer ; S. W. Smart, Assistant for Train Services ; O. S. Willmot (representing Mr. C. Gribble) ; E. A. Rampton, and F. J. Boughton, Chief Engineer's Office ; J. H. Knotts, late of Chief Engineer's Office ; E. V. Harvey, Colonel Hall's Office.

Messrs. E. W. Hallam, L. J. Boucher, L. J. M. Knotts, W. Pollott, R. M. Barfoot, F. Obert, F. Lyons, G. Guyatt, W. J. Heath, W. H. Adams, A. B. Bennett, Miss E. M. Stephens, Chief Inspector Cogger and other inspectors ; also representatives of the Drawing Office, and Accounts Office (all of the Signal and Telegraph staff).

Other Railways, &c. : Messrs. A. F. Bound, Signal and Telegraph Engineer, L.M.S.R. ; C. Carslake, Signal Engineer, and C. H. Hills, Chief Assistant (Signals), L.N.E.R. ; F. H. D. Page, Signal Engineer, G.W.R. ; W. S. Every, Signal Engineer, and Major Morkill, Assistant Signal Engineer, London Transport.

Contractors and Firms : Messrs. H. M. Proud, J. W. Royal, R. S. Griffiths, W. Shorter, C. F. Venning (Westinghouse Brake & Signal Co. Ltd.) ; F. L. Castle, F. Edwards (Siemens & General Electric Co. Ltd.) ; W. Nichols, General Electric Co. Ltd. ; W. Lang, Callenders Cable & Construction Co. Ltd. ; C. F. Minett, Lamp Manufacturing Co. Ltd. ; T. C. Elliott, D. P. Battery Co. Ltd. ; F. Sykes, Sykes Interlocking Signal Co. Ltd.

Societies and Institutions : Mr. G. H. Crook, President, Institution of Railway Signal Engineers ; Mr. W. F. Smith, representing Railway Convalescent Homes.

Forthcoming Events

Jan. 27 (*Fri.*).—Institute of Transport (Manchester–Liverpool), at Exchange Station Hotel, Liverpool. Visit of the President. Dinner.

Jan. 28 (*Sat.*).—Permanent Way Institution, at Inst. of Civil Engineers, Great George Street, London, S.W.1, 2.30 p.m. Annual Winter Meeting.

Jan. 31 (*Tues.*).—Institute of Transport (Bristol). Visit of the President. Dinner.

Feb. 1 (*Wed.*).—Diesel Engine Users' Association, at Connaught Rooms, Great Queen Street, London, W.C.2, 7 for 7.30 p.m. Annual Dinner.

Feb. 3 (*Fri.*).—Omnibus Society, at Inst. of Marine Engineers, The Minories, London, E.C.3, 7 p.m. "Organisation and Operation of Coaching Pools in North of England," by Mr. T. Gailey.

Feb. 4 (*Sat.*).—Permanent Way Institution (Manchester–Liverpool), at Manchester. "Track Defects : Their Prevention and Cure," by Mr. J. Whitely.

Permanent Way Institution (Southampton), at Terminus Station, 2.45 p.m. "Permanent Way Institution Convention in Germany, 1938," by Mr. W. A. Willox.

XUM

Head-on Collision Between All-steel Expresses

Results of the collision last September at Tortuga, on the Southern Pacific Railroad when a train travelling at 35-40 m.p.h. ran into a standing train

(*See illustrations on pp.* 144-145 *and editorial on p.* 125)

On September 20, 1938, a disastrous collision occurred at the passing place at Tortuga, California, on the Southern Pacific Railroad, U.S.A., when No. 5 westbound express, the Argonaut, travelling at 35-40 m.p.h. was wrongly turned into the loop line and collided head-on with No. 44 eastbound train, the Californian, which was waiting for it to pass, the loop points having been reversed at the last moment by a brakeman. Eleven persons were killed and 139 injured.

The Tortuga passing place, the layout of which, together with other particulars relating to the accident, is given on the accompanying diagram, lies between Indio, California, and Yuma, Arizona. The line is single throughout and equipped with semaphore type automatic signals operated on the so-called "straight" circuit system and track circuited. With this arrangement the signal at the leaving end of a loop does not go to "stop" directly a train leaves the next loop, if there are intermediate signals, but only when the block and overlap sections immediately controlling it are occupied. The Southern Pacific has always adhered to this system of working and found it to meet its requirements. The train running is, of course, controlled by a train despatcher, subject to the usual timetable and other rules common in American practice. The loop points at such places as Tortuga are ground-operated from switch stands, equipped with disc target indicators but not lamps; they are worked by the train crews and padlocked against unauthorised interference. The points have electric detectors proving them properly closed for the straight track before the relative signals can show the "proceed" indication, a very general practice on lines of this character in America. There is no electric locking on the switch stands, and their proper operation depends on obedience to rules. The principal rule concerned is known as No. 104 (c), its relevant part reading as follows:—

Trainmen and other employees must not unlock derails or main track switches to enter main track until the trains which are to be met or passed have cleared the switch, and must not stand within twenty feet of the switch stand while a train is closely approaching or moving over the switch. When practicable, they must take position on the opposite side of track from switch stand while train is passing. When a switch is thrown, the employee using it must see that both points have moved to proper position. A switch must be fastened as soon as thrown either way, and, when locked, the chain pulled to insure that lock is securely fastened.

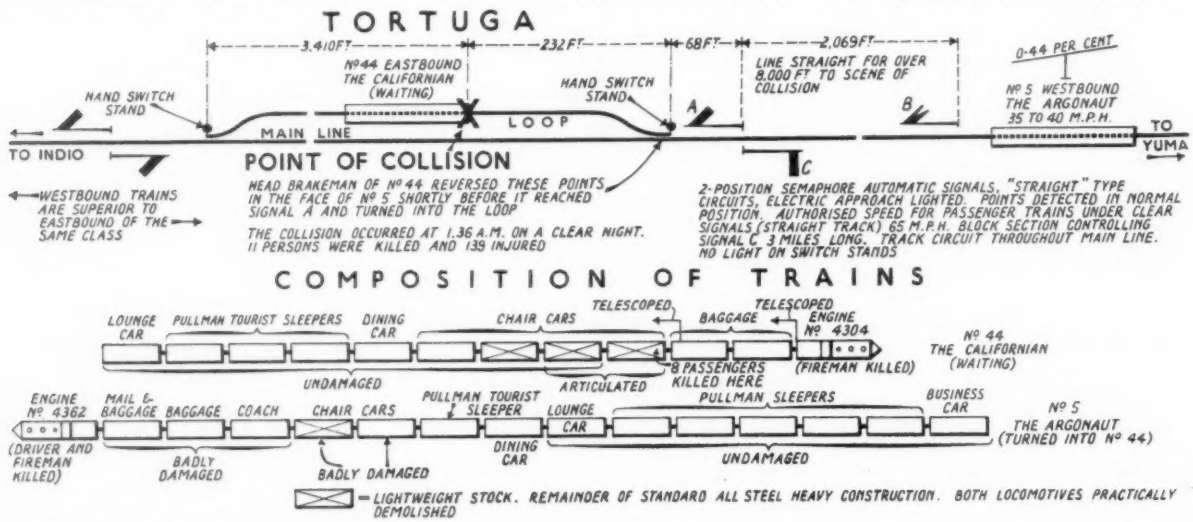
The object of this rule is, of course, to prevent hasty action by trainmen. When a train is waiting on the straight track to be passed the opposite train finds the home and distant signals "on," whatever the position of the points; but, if the former is on the loop, the signals will be "off" for the other train as soon as all points are set for the straight track, as on the night of the accident. Westbound trains are regarded as superior to eastbound of the same class on this section of line.

Origin of the Collision

Trains Nos. 5 and 44 frequently passed each other at Tortuga. No. 5 was superior to No. 44 by rule, but was usually instructed by train order to take the loop when meeting it; in 46 cases out of 50 between May 1, 1938 and the date of the accident this occurred. On the night concerned orders had been issued giving No. 44 right of way over No. 5 almost throughout the sub-division, but the trains received further orders at approaching stations directing them to pass at Tortuga, No. 44 to go into the loop, which it did at 1.32 a.m., four minutes before the collision, the head brakeman having opened the points at the western end to let it in. The conductor thereafter re-set them to normal, causing the signals to show "proceed." The train stopped 232 ft. from the eastern points, and the head brakeman went forward to them while the driver got down to oil. On seeing the headlight of No. 5 approaching, the driver remounted his engine and was looking out ready to identify the oncoming train when he saw, by the beam of its headlight, that the eastern points were set for the loop. He shouted to his fireman and jumped off, but the latter was killed. No 5 was heard to whistle just before the crash.

The brakeman said he had no thought at first of turning that train into the loop, but later forgot that it was to proceed on the straight and reversed the points. He attributed his blunder to the fact that the train usually took the loop when passing his train. Realising the error he tried to reset the points, but was too late. He admitted the mistake to his driver but could not recollect touching the points again, although they were found normal after the accident. It appears probable from the positions of some of the vehicles after the accident, that he reset the points to normal under the train. A man of 63, he had been found an efficient servant.

The driver and fireman of No. 5 train were killed, but evidence of others travelling on it showed it to have approached under clear signals and that it was probably close to the home signal when the reversal of the points would throw it to danger. The whistling showed that the driver was


TORTUGA
3,410 FT
232 FT
68 FT
2,069 FT
0·44 PER CENT
Nº 44 EASTBOUND THE CALIFORNIAN (WAITING)
HAND SWITCH STAND
HAND SWITCH STAND
LINE STRAIGHT FOR OVER 8,000 FT TO SCENE OF COLLISION
Nº 5 WESTBOUND THE ARGONAUT 35 TO 40 M.P.H.
MAIN LINE
LOOP
A
B
C
TO INDIO
TO YUMA
POINT OF COLLISION
HEAD BRAKEMAN OF Nº 44 REVERSED THESE POINTS IN THE FACE OF Nº 5 SHORTLY BEFORE IT REACHED SIGNAL A AND TURNED INTO THE LOOP
THE COLLISION OCCURRED AT 1.36 A.M. ON A CLEAR NIGHT. 11 PERSONS WERE KILLED AND 139 INJURED
2-POSITION SEMAPHORE AUTOMATIC SIGNALS, "STRAIGHT" TYPE CIRCUITS, ELECTRIC APPROACH LIGHTED. POINTS DETECTED IN NORMAL POSITION. AUTHORISED SPEED FOR PASSENGER TRAINS UNDER CLEAR SIGNALS (STRAIGHT TRACK) 65 M.P.H. BLOCK SECTION CONTROLLING SIGNAL C 3 MILES LONG. TRACK CIRCUIT THROUGHOUT MAIN LINE. NO LIGHT ON SWITCH STANDS
←WESTBOUND TRAINS ARE SUPERIOR TO EASTBOUND OF THE SAME CLASS→
COMPOSITION OF TRAINS
LOUNGE CAR
PULLMAN TOURIST SLEEPERS
DINING CAR
CHAIR CARS
TELESCOPED
BAGGAGE
TELESCOPED
ENGINE Nº 4304
Nº 44 THE CALIFORNIAN (WAITING)
UNDAMAGED
ARTICULATED
8 PASSENGERS KILLED HERE
(FIREMAN KILLED)
ENGINE Nº 4362
MAIL & BAGGAGE
BAGGAGE
COACH
CHAIR CARS
PULLMAN TOURIST SLEEPER
LOUNGE CAR
PULLMAN SLEEPERS
BUSINESS CAR
Nº 5 THE ARGONAUT (TURNED INTO Nº 44)
(DRIVER AND FIREMAN KILLED)
BADLY DAMAGED
BADLY DAMAGED
DINING CAR
UNDAMAGED
= LIGHTWEIGHT STOCK. REMAINDER OF STANDARD ALL STEEL HEAVY CONSTRUCTION. BOTH LOCOMOTIVES PRACTICALLY DEMOLISHED

Diagrams of passing loop at Tortuga, indicating circumstances of collision, and composition of trains involved

alert. Fortunately he was not driving at the authorised speed of 65 m.p.h. but had reduced speed, supposedly to enable him to identify the other train with certainty, otherwise the collision would have been even worse. The brakes are known to have been working correctly, and the automatic signals to have been in order.

Effect of the Collision

The circumstances of the accident and the composition of the two trains are shown in the accompanying diagrams. The force of the collision drove the stationary engine back 88 ft., and both it and the colliding engine were practically destroyed. They came to rest on their sides with their front ends about 10 ft. apart and some 20 ft. north of the north rail. The tender of the stationary engine, badly damaged but still attached to the engine, fell over on its left side. The first and second cars, coupled together, were derailed but remained upright and in line. The front end of the former was smashed in about 3 ft. by the tender, and it stopped about 20 ft. west thereof. The front of the third car, which was the leading part of a two-car lightweight articulated unit, was telescoped for a length of 18 ft. by the adjacent baggage car; the 8 passengers killed were all on the 16 seats within that length. The rear car in this unit and the other seven cars behind it were neither derailed nor damaged.

The locomotive of the oncoming train came to rest at an angle of about 45 deg. to the line, with its rear end fouling the straight track. Its tender and the first car stopped on their right and left sides respectively, parallel with the engine and badly damaged. The second car passed the first and came to rest upright and in line, with its front smashed in for a distance of 18 ft. and against the overturned locomotive. The rear end of the third car and the front end of the fourth are stated to have buckled to the south and fallen over on their left sides, stopping at an angle of about 45 deg. to the track, with their north ends adjacent to the rear of the second car, though the aerial view of the accident seems to indicate that the rear end of the fourth car, rather than its front, came to rest adjacent to the rear of the third car. The third car was badly damaged, and the fourth, of lightweight construction, smashed beyond repair. The front of the fifth car was forced to the north. This car, badly damaged, remained upright adjacent to and parallel with the fourth car. Both bogies of the sixth car, and the leading bogie of the seventh, were derailed. These two cars remained upright and coupled to the rear seven cars which were not damaged or derailed.

The behaviour of the lightweight stock called for special investigation by the inspector of the Interstate Commerce Commission, who inquired into the accident; these cars were between heavy standard type cars in each case and marshalled in advance of the heavier dining, lounge and sleeping cars. The commission's report says that the most violent impact occurred between the two locomotives, which were practically demolished, a great amount of the destructive shock being thus dissipated. The shock then progressed backward, carrying to the fifth car in No. 5 and to the third car in No. 44, there being no damage to equipment in either train beyond these points. There was considerable damage to the forward standard cars in each train, further dissipating the destructive force, but the first lightweight car in each train suffered the greatest damage. It was evident that their collapse further absorbed the destructive shock to such an extent that but little damage occurred beyond them.

The railway company's Car Construction Engineer said that the underframes of the light-weight cars were designed for a buffing strength of 180 tons, which met the strength requirements of the Post Office Department specifications. They had operated in service without trouble, but had never received such an accident test as this. The underframe of the first such car in train No. 44 stood the shock well though it cracked, but the superstructure fared worse. The car in front probably jumped up when its centre plate rivets went and so telescoped it. If the superstructure had stood as well as the centre sills there would have been considerably less damage and probably no fatalities, but he thought that, had the car been of standard construction, it would have telescoped just as much. The Cor-Ten steel being much harder than open hearth, its shearing value would be less, as was demonstrated by the open hearth end posts in the other cars bending instead of breaking. Such end posts would have resisted better and their use was being seriously considered, as well as the addition of certain other reinforcements. It was nevertheless safe, he thought, to operate the lightweight design with the ordinary type of car, and not necessary to place it in the rear.

The specification for the lightweight cars gives the general structure as of high-tensile alloy steel, of self-supporting welded type. Minimum yield point of the steel is 22·32 tons per sq. in.; minimum ultimate strength 33·48 tons per sq. in. The cars are sheathed in corrugated stainless steel. Tests on a frame and sections of one, made at the builders' works and at the Pennsylvania R.R. works, had shown very high values, such as 410 tons, before there was any sign of failure or distortion, a value beyond that specified as necesssary. Evidence was given on these points by the Pullman Company's engineer, who referred to another test of the same type of car made by the Pennsylvania Railroad in February, 1938, at Altoona. For this purpose the Pullman Company furnished a complete skeleton car frame without interior finish, windows, &c., which was subjected to a longitudinal compression test, under which the centre sills began to spread just behind the draft casting when a pressure of 175 tons was indicated by the hydraulic gauge, or at a pressure of 165 tons as indicated by Brinell. The test was stopped at this point and a plate $\frac{5}{16}$ in. × $22\frac{1}{2}$ in. × $25\frac{9}{16}$ in. was applied to the bottom of the sill, after which the test was continued up to a pressure of 405 tons on the hydraulic gauge. The draft casting failed at 393 tons and the centre sill cracked at 405 tons. These tests were made in connection with the construction of similar cars for service on the Pennsylvania RR.

Conclusions of the Commission

The report concluded that the accident was caused by points being reversed directly in front of train No. 5, through the brakeman's blunder. No tests were made by the Southern Pacific as to the strength and stability of the lightweight cars, as compared with the heavy steel cars of standard designs with which they were associated in trains. Apparently the cars were accepted with the understanding that they met the Post Office Department specifications for mail cars, and that the underframes were designed to withstand buffing stresses of 180 tons. These specifications require a safety factor of two in the calculation of buffing stresses, fixing the minimum for actual failure due to buffing shocks at 360 tons. It appears that the manufacturer relied upon calculations and the result of two tests made with an 8-ft. section of the underframe in the matter of buffing strength, rather than on any test with a complete car structure. A few months subsequently to the construction of the Southern Pacific cars involved in this accident, tests were made by the Pennsylvania R.R. of the same type of car, using a complete underframe with skeleton car body, furnished for the purpose by the same manufacturer, and in these tests the centre sills began to spread at 175 tons pressure; a reinforcing plate was then applied, and pressure increased to approximately 400 tons before failure occurred. It does not appear that a similar reinforcing plate was applied to the Southern Pacific cars.

During the development in recent years of the so-called lightweight, streamlined equipment for passenger train service, the Bureau of Safety has on various occasions stressed the necessity for maintaining that high degree of safety which has been developed by years of experience in steel passenger-car construction. The annual report for the year ended June 30, 1936, in referring to such cars, said that " Equipment of this type must be considered as being still in the experimental stage. As yet there is no case on record where a train of this type has been involved in a serious collision or derailment, of such character as to furnish data relative to its ability to withstand impact shocks and tearing and shearing stresses."

The present accident constitutes the

first demonstration of the ability of such equipment to withstand impact shocks of a major collision; what would have occurred had either train been made up entirely of standard equipment or lightweight equipment is a matter of mere conjecture or speculation. The results raise a grave doubt whether the operation of such lightweight cars between or ahead of heavy all-steel cars of standard design should be permitted until their ability to withstand shocks with equal safety has been proven by appropriate tests; furthermore, the effect of operating cars without buffers in association with cars having buffers also should be given careful consideration.

Recommendation

It was recommended that railroad officials should give serious consideration to discontinuance of operation of so-called lightweight cars between or ahead of standard cars unless and until the strength of construction has been determined by suitable tests to be substantially the same as that of other cars with which they are associated in the formation of trains.

The report is signed by the Director of the Bureau of Safety of the Interstate Commerce Commission, Mr. W. J. Patterson.

STAFF AND LABOUR MATTERS

Railway Staff National Tribunal

On Tuesday last, January 24, the Railway Staff National Tribunal, sitting at Montagu House, Ministry of Labour, began the hearing of the claims submitted by the three railway trade unions for shorter hours and improvement in rates of pay and conditions of service. Before the proceedings began, the Chairman made reference to the death in December last of Mr. W. Griffiths, late President of the National Union of Railwaymen, and the tribunal stood in silent tribute to his memory.

The members of the tribunal were Sir Arthur Salter, K.C.B., D.C.L., M.P. (Chairman), Sir Harry B. Shackleton, member nominated by the railway companies, and Mr. H. J. May, O.B.E., J.P., member nominated by the trade unions.

The assessors nominated by the railway companies were Sir James Milne, K.C.V.O., C.S.I., General Manager, Great Western Railway; Sir William V. Wood, Vice-President, London Midland & Scottish Railway; and Mr. Kenelm Kerr, O.B.E., Assistant General Manager (Staff), London & North Eastern Railway. The assessors nominated by the trade unions were Mr. F. J. Burrows, J.P., National Union of Railwaymen; Mr. W. J. Evans, Associated Society of Locomotive Engineers & Firemen; and Mr. F. C. Watkins, J.P., M.P., Railway Clerks' Association.

The advocates were Mr. G. L. Darbyshire, O.B.E., Chief Officer for Labour and Establishment, L.M.S.R., for the railway companies; Mr. J. Marchbank for the National Union of Railwaymen; Mr. W. J. R. Squance for the Associated Society of Locomotive Engineers & Firemen; and Mr. W. Stott for the Railway Clerks' Association.

Terms of Reference

The terms of reference were to ask the Railway Staff National Tribunal, established under the Appendix, Part VI, to the agreement in regard to Machinery of Negotiation for Railway Staff dated February 26, 1935, to hear and decide the following claims:—

By the National Union of Railwaymen

(1) That the minimum rate of wages payable to any adult conciliation grade employee shall be not less than 50s. a week.

(2) That the arrangement for spreadover working provided for in Clause 27, Section IV (*c*) of National Wages Board Decision No. 2, dated January 24, 1922, and Clause 99 of National Wages Board Decision No. 119, dated March 5, 1931, be terminated.

(3) That two weeks' holiday—12 weekdays—with pay be given to all employees embraced in the conciliation scheme grades.

(4) That the arrangement for extended rosters provided for in National Wages Board Decision No. 2, Clause 27, Section IV (*a*) of January 24, 1922; No. 12, Clause 55, of December 18, 1923; and No. 14, Clause 5, of December 22, 1924, be terminated.

(5) That all staff in salaried and conciliation grades shall be paid a minimum of four hours' pay at Sunday rates for each time of signing on duty on Sundays. This proposes to amend the conditions set out in National Wages Board Decision No. 12, Clause 61, Section 2, paragraphs (1) and (3), dated December 18, 1923.

(6) That when staff in conciliation grades are rostered for five long and one short turns of duty in accordance with the provisions of circular letter No. 1,786 of April 3, 1919, paragraph 1, the short turn shall be worked on Saturday morning.

By the Associated Society of Locomotive Engineers and Firemen

(1) RATES OF PAY:—

Drivers and Motormen—

	s.	d.	
1st, 2nd, and 3rd years ..	13	0	a day
4th and 5th years	14	0	,,
6th year	15	0	,,
7th year and onwards ..	16	0	,,

Firemen—

	s.	d.	
1st, 2nd, and 3rd years ..	10	6	a day
4th and 5th years	11	0	,,
6th to 8th years	11	6	,,
9th year and onwards ..	12	0	,,

Firemen not appointed after completing 313 driving turns to be paid the driver's minimum rate when firing, irrespective of years of service as fireman.

Engine Cleaners—

Age in years:—	s.	d.	
16 and under	4	0	a day
17 years	5	0	,,
18 ,, ...	6	0	,,
19 ,, ...	7	0	,,
20 and 21 years	8	4	,,
22 years and over	9	0	,,

Cleaners not appointed after completing 313 firing turns to be paid the fireman's minimum rate when cleaning, and receive a fireman's uniform.

(2) HOLIDAYS:—

After twelve months' service two weeks' holidays—twelve weekdays—with full pay to be given, annually.

(3) SUNDAY DUTY:—

All time worked between midnight Saturday and midnight Sunday to receive payment of a minimum of eight hours' pay, plus half-time for all time worked, for each time of signing on duty.

Turns commencing on Sunday extending into Monday to receive payment of a minimum of eight hours' pay, plus half-time for all time worked, and to be exclusive of the guaranteed week.

(4) HOURS OF DUTY:—

Cancellation of the provision for an extension of rosters, where economy will accrue, up to nine hours a day.

By the Railway Clerks' Association

(1) SALARIES

Clerical Staff (Men)—

	Age	Proposed Scale £
Class 5 ..	24	140
	25	160
	26	170
	27	180
	28	190
	29	200
	30	210
	31	220
Women—		s. d.
Class 2 ..	29	55 0
	30	62 6
	31	67 6
Class 1		72 6
		75 0
		77 6

£20 to be added to each amount in each class above Class 5 for men and Class 1 for women.

STATIONMASTERS, &C., AND SUPERVISORS

	Proposed Scale £
Class 6 (Stationmasters)—	
1st year	160
2nd ,, ...	170
Class 5—	
1st year	180
2nd ,, ...	190
3rd ,, ...	200
4th ,, ...	220

£20 to be added to each amount in each class above Class 5.

R.C.H. NUMBERING STAFF

	Age	Proposed Scale £ s. d.
Class "B" points	25	135 4 0
	26	137 16 0
	27	140 8 0
	28	145 12 0
	29	150 16 0
	30	156 0 0
Class "A" points	31	161 4 0
	32	166 8 0
	33	169 0 0
	34	174 4 0
	35	176 0 0

£20 to be added to the salaries of the working foremen and supervisors.

(2) NIGHT DUTY.—In the case of those not in receipt of the aggregation allowance, all time worked between 10 p.m. and 4 a.m. shall be paid for at the rate of time and a

quarter, it being understood that the night off in ten for continuous night duty should continue, but that the night off in fifteen for intermittent night duty should be discontinued.

(3) HOURS OF DUTY.—A forty-hour week, to be covered by turns of duty, none of which shall exceed from start to finish (including meal-times) nine hours, except by local arrangement which would require to be endorsed by a central authority—say, a sectional council, &c.

(4) ANNUAL HOLIDAYS.—All annual holidays shall be given between the months of May and September (inclusive) if so desired by the staff concerned, the following to be the periods :—

	Weekdays
Under 20 years' service ..	12
20 years' service and over ..	15
30 years' service and over ..	18

The N.U.R. Case

Mr. Marchbank, presenting the claim of the National Union of Railwaymen, submitted to the tribunal a number of documents, including a statement giving particulars of adult conciliation grade employees with base rates of pay of less than 50s. a week; weekly household budgets of a number of men; a statement showing the current Trade Board rates for a number of industries at January 1, 1939; and a statement containing extracts from various National Agreements and decisions of the National Wages Board.

Dealing with the claim for a minimum wage of 50s. Mr. Marchbank referred to the fact that a similar claim was dealt with by the tribunal in 1937, when a decision was given, which, he said, indicated that the tribunal felt that something should be done for the staff affected, and the tribunal had awarded increases to the conciliation staff with base rates of 45s. and under. He dealt very fully with the weekly household budgets which he had submitted to the tribunal, and concluded his examination of them by saying that there was no doubt that a rate of less than 50s. a week was insufficient to enable the men to live in what might be regarded as constituting a decent standard of living. He referred to the book "The Human Needs of Labour," written by Mr. Seebohm Rowntree in 1937, from which he quoted extensively. Of the grades included in the statement giving particulars of adult conciliation grades with base rates of pay of less than 50s. a week, Mr. Marchbank referred specially to the permanent way staff and to crossing keepers. He gave particulars of the numbers of staff employed in these grades, outlined their duties, and dealt with their prospects of promotion. He referred to the recent arbitration proceedings in regard to Post Office workers, and contrasted the rates awarded by the Civil Service arbitration tribunal with the rates paid to some of the railway workers.

In connection with the claim for the termination of spreadover working, Mr. Marchbank outlined the history of negotiations with regard to spreadover working since its introduction in 1922, and he quoted examples of how the arrangements operated. In pressing for its termination he said that the arrangement was very objectionable to his members, and while, under its operation, men may not be called upon to perform more than 8 hours' actual work, the time which is taken up by the operation of the spreadover makes it almost impossible for men to engage in some of those activities with which they feel disposed to occupy themselves during leisure hours.

When dealing with the claim for an increase in holidays, Mr. Marchbank cited a number of countries and the amount of holidays given in each. These included Norway, U.S.S.R., Italy, Australia, South Africa, U.S.A., New Zealand, Luxembourg, Sweden, and Switzerland. He referred to the report of the Government Committee on Holidays with Pay, from which he quoted certain passages, and he gave particulars of the number of workpeople receiving paid holidays. He contended that extra holidays were necessary on account of the intensified methods of working at the present time and said there were special features about railway work which did not apply in other industries. He instanced shift working and irregular hours.

In connection with the claim for the termination of extended rosters, he outlined very fully the history of negotiations which had taken place in connection with previous claims for their termination. He submitted that the provision was unnecessary and said that it was one to which men took very strong exception.

On the claim concerning the minimum payment for Sunday duty, Mr. Marchbank submitted that the union was seeking uniform payments for all men called upon to work on Sundays, and he submitted that the present varying methods of payment were unsatisfactory and that the minimum payments in certain respects were inadequate.

The last item in the claim was in regard to the working of short turns of duty on days other than Saturday, and Mr. Marchbank said the union was asking that the generally accepted practice operating at the time the original National Agreement was made in regard to staff working five long turns and one short turn of duty, should be clarified by a definite decision that when the short turn was worked it must be on Saturday morning. He submitted that the proposal was consistent with the generally accepted method of working short turns in industry.

As we go to press, Mr. Squance is presenting the claim of the Associated Society of Locomotive Engineers & Firemen.

Northern Ireland Road Transport

Statement by Belfast Chamber of Commerce

On page 35 in THE RAILWAY GAZETTE of January 6 a paragraph in the Notes and News columns indicated briefly that the Belfast Corporation was averse to the recommendation of the M'Lintock Committee that its tramway and bus services should be amalgamated with the rail services, and we are now able to give the full text of a statement expressing the views of the Belfast Chamber of Commerce :—

"The Council of the Belfast Chamber of Commerce, having given consideration to the report and recommendations of the committee presided over by Sir William M'Lintock on the question of road and rail transport in Northern Ireland, has come to the following conclusions :—

1.—"It is recognised that for purposes of co-ordination, facility of operation, service, and economy, transport in Northern Ireland should be under unified control, but that all transport within the City of Belfast should remain excluded.

2.—"No further restriction than is at present in operation should be placed on private traders not carrying for hire, reward, or any consideration in kind.

3.—"That the provisions of the Road and Railway Transport Act (N.I. 1935) be enforced against any persons, firms, or companies carrying foods in contravention of that Act.

4.—"That in view of the fact that the Government has already incurred commitments to the extent of approximately £3,000,000 under guarantee which must be implemented, and that the issued stocks of the Road Board are approximately £850,000 nominal value, these stocks should be acquired by the Government at an agreed value having regard to the trading losses already suffered. The Government would then have complete proprietary interest in all road transport. That a transport board be set up to take complete control of all forms of transport except as herein provided. That, in view of the complications, delays, and financial difficulties associated with the capital acquisition of all transport undertakings, the existing road and railway transport undertakings be leased to the new unified control on the terms that the annual profit of this new undertaking be apportioned between the existing undertakings on an agreed formula. By this arrangement the proportion of profits received by the Government (as the owner of road transport) and by the railways would be available to each of them to meet their existing obligations. That it is essential, in addition to effecting economies, to fix traffic rates which will allow for a reasonable margin of profit.

5.—"The new unified control should have absolute freedom of action in the administration of transport, but the Government of Northern Ireland should always have the right to nominate at least one-half of the members of the new unified control.

6.—"That any Bill introduced in future by the Government to legislate for public transport, or to amend the present Acts relating to road and railway transport in Northern Ireland should be made available in sufficient time to enable public bodies to give consideration to its provisions, and to make any representations in regard thereto."

XUM

Lord Stamp on the "Square Deal"

Addressing the Manchester Chamber of Commerce on January 18, Lord Stamp replied from the railway viewpoint to matters raised in the recent conferences with trade and industry

The amplified proposals in their "square deal" campaign submitted by the railway companies to the Transport Advisory Council on January 13 (set out in full in our January 20 issue), were the subject of an address by Lord Stamp, Chairman and President of the Executive, L.M.S.R., to the Manchester Chamber of Commerce on January 18.

Lord Stamp said that the claim of the railways for equality was one they had urged for some years. Equality could be considered in its relation to financial, operating, and commercial conditions. Hitherto commercial equality between road and railway had been sought by the process of imposing conditions of carriage on road operators, but this had proved very gradual. The railways were now approaching the matter from the angle of taking the conditions off themselves so that they might have the same freedom as the roads. Concern had been expressed in some quarters that in their proposals the railways had not provided restrictions on their own activities. This was because they considered that a better course than inventing and guarding against the sins they might be prone to, was to learn from discussion with other commercial interests exactly what it was feared the railways might do. These apprehensions seemed to be (1) that the railways would indulge in wholesale rate-cutting, lose money for everybody, and finish up worse than they started; (2) that they would first drive road hauliers off the market by rate-cutting, and then raise their rates and rook the trader; (3) that the railways would lose money by cutting their rates for competitive traffic, and try to recoup it by putting up their charges on the heavy trades where they still had a monopoly; and (4) that the railways would arrange their rates with the roads on a non-competitive level and so form a combine against public interest.

Lord Stamp pointed out that the railways had the same incentive as before not to lose good revenue by wholesale rate cutting, and if they had elasticity to meet competition where it occurred and made commercial bargains on detailed services instead of trying to fit an obsolete rigid scheme, it must be better for traders and railways alike. Secondly, it was not a practical purpose to drive the hauliers off the roads and then establish a monopoly; the railways would be bankrupt before they had done it, and the vast numbers of "C" licences and their availability were a safeguard, to say nothing of the right of appeal they were contemplating. Under (3), *i.e.*, losing money on some classes and raising it on others, that was rather the present than the future position, because it was the statutory duty of the tribunal to put up rates where it could to improve revenue. The railways proposed to give the heavy trades some safeguards against this contingency that they had not at the present, because the rates must not be "unreasonable," and this was quite a different criterion from the automatic one now in operation. In the fourth place, the arrangement to get together with the roads and fix high rates was a question for both sides, because (1) the uncombined character of the roads made competition even amongst themselves still likely; (2) because of the free initiative of the trader to have his own vehicle; and (3) because of the appeal against unreasonable charges.

Some people said it was not fair for the railways to ask for their freedom unless they indicated exactly all they proposed to do at every point in the years to come. One might as well ask the canary where he proposed to fly when his cage door was opened. At any rate, with the uncertain economic future, the railways could only claim that the exercise of their freedom must in the long run harmonise with the interests of the trader if they were to retain his goodwill and their own financial position. There had been much misunderstanding on the question of undue preference. In exercising their freedom the railways wished to be in a position to combat competition of other forms of transport at the particular points where it occurred, but he could say quite freely that, apart from any inequalities of charging which might thus be forced upon them as between different areas, they had no desire or intention to make any discrimination at all between two traders where their circumstances and traffics were identical. In any case, under the proposal that the railways had made that a trader could bring grievances through his association to the regular conference, any instance where the procedure was thought to be unreasonable could be brought then to be ventilated and any grievances adjusted.

In some industries, particularly with coal, whose traffic had no alternative form of transport over a large part of its area, it had been found in discussion with the railways that the interests of different areas were not always identical. The railways agreed that in such circumstances there should be a court of appeal against railway charges. To coal, iron, and steel the railways had offered regular periodical conferences at which they should discuss any changes in rates that were desirable, and also any problems of different localities or different individuals that could be brought up. They had suggested that on both sides there should be the fullest supply of relevant information for the points raised. This obviated the preparation and publication of vast masses of material for everyone in general, whether wanted or not, and should meet the difficulties in the majority of cases. Then the railways suggested there should be provided by Statute a committee or court of reference or arbitration or appeal, that could deal with matters not disposed of at the regular conferences.

Lord Stamp concluded by stressing the urgency of the railways' case, and also of its national necessity. All European railways, he contended, were now either run by the State at a deficit, or were openly subsidised. British railways had no desire to join them, and did not think, with a square deal, that would be necessary.

London (East) Divisional Engineer's Staff Dinner, S.R.

The annual staff dinner, London (East) Divisional Engineer, Southern Railway, was held at the Windsor Castle Restaurant, Victoria, on January 20; Mr. F. E. Campion, Divisional Engineer, presided, and amongst those present were:—

Mr. C. A. G. Linton, Assistant Engineer (General Maintenance); Messrs. D. R. Bennett, A. Usherwood, A. Curtis, E. Rampton and others representing the Chief Engineer's Office, Waterloo; Messrs. C. V. Hill and A. B. Chester, divisional engineers, Southern and Central Divisions, respectively; Mr. D. Sheppy, Eastern Divisional Locomotive Running Superintendent; Mr. P. Nunn, London (East), and Mr. C. J. C. Latham, London (Central), Divisional Superintendent; Mr. E. E. Young, London District Freight Superintendent; Mr. W. A. Willox, THE RAILWAY GAZETTE; Major Fullerton Tofts, Captain Ryder.

Altogether about 130 persons sat down to an excellent dinner.

Mr. C. W. King, Assistant Divisional Engineer, proposed the toast of the Chairman, which was very enthusiastically received and accorded musical honours. Mr. King made use of the four words "London (East) Divisional Engineer," using each letter to form another word applicable to the Chairman.

The Chairman responded in a happy vein, referring to the changes in personnel which had occurred on the division during the year and expressing his appreciation of the good work done by the staff. He concluded his speech with some original verses relating to the clerical staff, which were much enjoyed.

Mr. J. T. Cloke, Chief Clerk, proposed the toast of "The Visitors," which was responded to by Mr. D. Sheppy, Eastern Divisional Locomotive Running Superintendent.

The company then settled down to enjoy a programme of music and song provided by Syd. Murray's concert party. The evening finished with the singing of "Auld Lang Syne" and the National Anthem, and after a vote of thanks to the committee responsible for the arrangements the party dispersed.

RAILWAY AND OTHER MEETINGS

Bengal & North Western Railway Co. Ltd.

The annual general meeting of the Bengal & North Western Railway Co. Ltd. was held at Winchester House, Old Broad Street, E.C.2, on January 24, Lt.-Colonel T. E. Gracey, R.E., Chairman of the company, presiding.

The Chairman, in moving the adoption of the report and accounts, said that before proceeding to deal with the ordinary business of the day, he must refer to the great loss the company had sustained by the death of Sir Leonard L. Cohen, K.C.V.O., on April 10, 1938. He had been a member of the board for a period extending over 37 years and his sound financial knowledge was always at the disposal of the board, and his far-sighted wisdom had been a great factor in building up the sound financial position that the railway now enjoyed in spite of the great upheavals of the last 25 years.

To fill the vacancy on the board, Sir Maurice Brayshay had been elected a Director. Sir Maurice had just retired from being Agent of the Bombay, Baroda & Central India Railway, and had experience as Member of the Railway Board and Acting Chief Commissioner of Railways; his presence would help the board to deal with the many questions that affected railways in an India whose politics were now in a state of flux.

The gross earnings of the joint undertaking amounted to just over 375 lakhs of rupees, being Rs. 20 lakhs less than the record earnings of last year, but Rs. 4 lakhs better than the previous record year of 1927. On the company's line the gross earnings decreased by Rs. 6·6 lakhs, and on the Tirhut line by Rs. 13·4 lakhs. The coaching receipts fell by Rs. 1·70 lakhs and the number of passengers carried decreased by 799,842, due principally to suspension of train services in the second half of the year owing to heavy rains and floods. Goods traffic showed a decrease of 706,219 in the total tonnage lifted, with a decrease of Rs. 18·67 lakhs in earnings. This was principally due to a heavy falling off in rice and sugar cane traffic.

Working expenses increased by Rs. 2·80 lakhs due to the renewals of goods vehicles, the continuance of the programme of renewals of locomotives, rebuilding coaching stock and relaying of the main line with heavier rails. This heavy expenditure had been partly set off by reduced charges for earthquake damage repairs, which were now nearing completion. The percentage of working expenses to gross earnings rose from 44·04 per cent. to 47·15 per cent.

The company's share of the net earnings as shown in the net revenue account amounted to £856,947, being £92,713 less than last year. After deducting the small loss by exchange under the book rate of 1s. 6d. per rupee and making the necessary adjustment for taxes, payment of interest on debenture and preference stocks, interim dividend and bonus, and providing as usual the £35,000 for the sinking fund, the amount to be dealt with stood at £320,919. From this they recommended the payment of a final dividend of 7 per cent., together with a bonus of 3 per cent., making for the whole year a total dividend and bonus of 18 per cent., the same as last year. The carry-forward would then be reduced from £113,986 to £65,919.

The most important single event of the year was the very heavy rainfall and consequent flooding of a very large portion of the country served by the railway. Such high and widespread floods had not occurred for many years, and though the line as a whole had stood up very well, there had been much dislocation and stoppage of traffic. The main line communication between Colonelganj and Sarju stations, west of Gonda, was interrupted from August 5 to August 25; the Ajodhya branch was closed from August 7 to August 14; between Chupra Kacheri and Khaira the line was closed from August 15 to September 1, and again from Sepetmber 21 to September 25.

In the beginning of August the whole country between Darbhanga and Nirmali was under water, and the lines to Bhaptiahi, which were closed at the end of May, had not been opened yet. The fact that the whole countryside was under water had a serious effect on earnings, both passenger and goods, and he was afraid would continue to do so, to some extent.

The attack by the Kosi River on the Eastern branch and the Mansi Bhaptiahi sections of the Tirhut State Railway continued with undiminished severity and they were continuing the policy of maintaining communication with temporary lines and semi-permanent pile bridges. Sir James Williamson, their Managing Director, who had an intimate knowledge of these rivers for the last 33 years, was now in India, and amongst the most important of his tasks was the thorough inspection of the situation caused by the vagaries of the Kosi River.

The doubling and bridging of the main line between Chupra and Sonepore had been started, but little progress had so far been made owing to floods and delay in obtaining the necessary land. The board's policy had always been to try and improve the general amenities of the railway, especially with regard to the comfort of the lower class passenger, and in this way to combat any drift away from the habit of making use of the railway. In this connection the Chairman had just received a letter from Sir James Williamson, in which he wrote: "What I have so far seen of the Bengal & North Western Railway indicates that the standard of administration and maintenance is being maintained and that the improvement in amenities for lower class passengers which have been in progress, such as waiting accommodation, food supplies, and general conveniences, are becoming noticeable features throughout the railway."

Last year a memorandum was sent to the Railway Board, pointing out that the reduced scales of pay introduced a few years ago had failed to attract suitably qualified candidates for vacancies in the railway service, especially those recruited outside India. The Railway Board regretted it did not see its way to alter the scales of pay, and had no doubt that the railway could get candidates for positions at the emoluments offered. In conjunction, therefore, with all the other company railways in India, the board had addressed a joint communication to the Secretary of State for India, pointing out their deep misgivings and suggesting a new scale of pay that they thought would attract candidates suitably qualified to maintain the high standard to which they had been accustomed in their superior staff.

The traffic prospects for the current half-year were not unsatisfactory, but the working expenses were likely to show an increase. The Chairman concluded with an expression of the board's high appreciation of the excellent work of the staff in India and in the London office.

After answering some questions by shareholders, the Chairman put to the meeting the resolution for the adoption of the report and accounts, which was seconded by the Rt. Hon. Lord Meston and carried unanimously.

The Chairman then proposed: "That a final dividend of £7 per cent. and a bonus of £3 per cent. for the six months ended September 30, 1938, on the ordinary stock of the company, less income tax, be, and the same are hereby declared, making with the interim dividend of £4 per cent. and a bonus of £4 per cent. paid on July 25, 1938, a total dividend of £18 per cent. for the year ended September 1938." Sir Malcolm N. Hogg seconded the motion, which was carried unanimously.

The Chairman proposed the re-election as a Director of Lt.-Colonel W. R. Izat. Sir Malcolm N. Hogg seconded, and the resolution was carried unanimously.

The re-election of Sir Malcolm N. Hogg was proposed by the Chairman, seconded by Sir Maurice Brayshay, and unanimously carried.

Mr. Renwick, a shareholder, proposed the re-election of the auditors; Mr. Rountree seconded, and the resolution was adopted unanimously.

Mr. Rountree proposed a vote of thanks to the Chairman and directors, to the Agent, and to the staff in India and England. Miss Monckton seconded, and the resolution was carried unanimously.

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RAILWAY AND OTHER REPORTS

Trans-Zambesia Railway Co. Ltd.—Coupon No. 11, representing interest for the half-year to February 1 next on the Trans-Zambesia Railway Company's 3½ per cent. guaranteed notes, will be paid on and after that date by Erlangers Limited, 4, Moorgate, E.C.2.

National Omnibus & Transport Co. Ltd.—This company, a subsidiary of Thomas Tilling Limited, reports a profit for the year 1938 of £127,871 for 1938, against £109,566 for the previous year. An ordinary dividend of 8 per cent., tax free, is again recommended, but being payable on £250,000 more capital will require £100,000, against £80,000. The sum of £10,000 is again placed to general reserve, and the amount to be carried forward is £30,815, against £30,443 brought in.

Tilling & British Automobile Traction Limited.—The directors recommend a dividend of 4 per cent. for the half-year ended December 31, 1938, and a further dividend of 2 per cent. for the year on the 8 per cent. participating preference shares (making a total of 10 per cent. for 1938, the same as for 1937 and 1936); and a final dividend of 5 per cent., free of tax, on the ordinary shares, making 9 per cent., tax free, for 1938, against 10 per cent., less tax, for 1937. Net profits for the year amounted to £511,587, against £442,099.

British Columbia Electric Railway Co. Ltd.—The accounts of this company (which is controlled by the British Columbia Power Corporation), show that net earnings for the year ended June 30 amounted to £418,558 (against £437,259 for 1936-37). After crediting £8,720 brought in, charging £118,497 for debenture interest, and providing £19,610 adjustment in respect of depreciation for prior years, £289,170 is available for distribution. Final dividends are to be paid of 2 per cent. on the preferred stock and 3 per cent. on the deferred stock (making 5 per cent. and 6 per cent. respectively for the year, against 5½ per cent. and 7½ per cent.), leaving £804 to be carried forward.

South Behar Railway Co. Ltd.—The report states that after paying the dividend at the rate of 5 per cent. per annum for the half-year ended December 31, 1937, a balance remained in hand of £5,492, which, with the amount received from the Secretary of State for India for the half-year to June 30, 1938, and other receipts, less interest on debenture stock, &c., left £14,997 to the credit of revenue account at that date. An interim dividend at the rate of 5 per cent. per annum was paid last July, leaving £5,508 to carry forward. Adding to this £15,000 received from the Secretary of State for India for the half-year to December 31, 1938, and other receipts, less interest on debenture stock, &c., there remains £14,343 to be dealt with. The directors recommend a dividend at the rate of 5 per cent. per annum for the half-year. This will absorb £9,489 and leave £4,853 to be carried forward. Stockholders were advised in June that the Secretary of State for India had given the requisite 12 months' notice of his intention to terminate the companys' contract with effect from July 1, 1939. Individual stockholders will be notified in due course as to the procedure to be followed for the redemption of their holdings.

National Provincial Bank Limited.—The directors report that, after making provision for rebate of discount on current bills and after making a transfer to the credit of contingencies account, out of which account provision for all bad and doubtful debts has been made, the net profit for the year ended December 31, 1938, was £1,771,785 and £573,715 was brought forward. A final dividend of 7½ per cent., making 15 per cent. for the past year, less income tax, is now declared, payable on January 25. The dividend for the year absorbs £1,421,912; £100,000 is placed to Bank Premises Account and £250,000 to Pension Fund; and £573,588 is carried forward.

Thos. Cook & Son (Bankers) Ltd.—This subsidiary of the well-known travel organisation has been responsible since its formation in 1924 for the banking business of the firm. As a private concern no profit and loss account is published. For the year ended October 31, 1938, current and other liabilities were £4,022,180, compared with £4,469,910 in the previous year, but were covered to the extent of approximately 73 per cent. by cash and short-term loans. Investments are shown as £781,459, of which £721,355 are represented by British Government securities. The published reserve fund at £125,000 is equal to the paid-up capital, and the internal reserves are substantial.

Leyland Motors Limited.—Trading profit for the year to September 30, 1938, was £766,943, against £746,951, and total profit £770,145, against £750,686. Depreciation takes £82,701, directors' remuneration £24,511, pensions, &c., £19,672, leaving a net balance of £643,261, against £631,597. Provision for taxation and contingencies takes £277,141, against £224,074, and £100,000, against £150,000, is allocated to general reserve. Preference dividends take £49,481, and the proposed dividend of 25 per cent., less tax, on the ordinary shares requires £163,125, leaving £137,984 to be carried forward, against £84,470 brought in.

Forthcoming Meetings

Feb. 1 (*Wed.*)—**Forth Bridge Railway Company** (Statutory General), King's Cross Station (L.N.E.R.), N.1, at 11.15 a.m.

Feb. 8 (*Wed.*)—**Weymouth & Portland Railway Company** (Ordinary Half-Yearly General), Regis House, King William Street, E.C.4, at 3.30 p.m.

Southern Railway Posters

Recent posters issued by this system advertise improved facilities for travellers from London to the South Coast, and the now well-known amenities of the train ferry service. Electrification last summer from Victoria to Bognor, Littlehampton, and Portsmouth, now justifies the railway in proclaiming that to those going "South for Winter Sun" it can offer "trains every few minutes." This information is conveyed in an unusual design by "Rice," with the buildings of London forming a dark foreground, and two folds of hilly country lying between them and the sea. Diving into the valleys and appearing on the hillcrests are Southern Electric trains, leading the eye by a zigzag course to the sea, visible through a dip in the hills.

Another seaside service is the subject of "Shep's" poster, "Bournemouth Limited," with a boldly-coloured drawing of the train in its new livery running diagonally across the sheet, flanked by interior views from photographs of first and third class coaches. A blue panel bears the inscription in white, "Try the latest and most luxurious railway carriages yet designed for ordinary fares."

The train ferry poster is designed by G. Massiot. Its keynote is two trains, in red and black, running in opposite directions and extending right across the blue band in the centre of the poster representing the Channel. They are supported in the middle of their sea crossing by passing through one of the ferry steamers, shown in white. Bounding the buff tints representing England and France, and impinging to a small extent upon the Channel, are the initials "S.R." At the top of the poster is the headline "While *you* sleep," the emphasis suggesting that although the passenger enjoys oblivion, those responsible for his safety and comfort are very wide awake.

London Transport Posters

The London Passenger Transport Board is exhibiting a series of posters which seems to have the excellent intention of persuading people to stay in town for food and recreation after the day's work, instead of all flocking home together at 5.30. The posters are humorously drawn by "Severin," whose types of pleasure-seeking Londoner in café, restaurant, and cinema are kindly caricatures that repay a few moments' study. In the final poster of the series, "The Way Home" is depicted, with crowds converging on an Underground station. The time is 10.30 p.m., and we hope none of the homeward-bound travellers will find that while they have been amusing themselves the board has been busily chopping eight-coach trains into two sections of four, so that they have a crowded journey home after all.

NOTES AND NEWS

Push-and-Pull Trains for Harrogate.—Push-and-pull units will shortly be put into service on the L.N.E.R. in the Harrogate and Pateley Bridge, Harrogate and Pilmoor, and Harrogate and Bradford services.

Collision near Hatfield, L.N.E.R.—A collision occurred on Thursday morning near Hatfield, L.N.E.R., when the 8.25 a.m. train from Cambridge to King's Cross ran into the rear of the 7.34 a.m. from Cambridge to King's Cross. Two passengers were killed, and seven injured.

Argentine Transandine Railway Purchase.—The agreed price for the purchase of the Argentine Transandine Railway by the State, under the Bill which has been approved by the Argentine Senate as well as by the Chamber of Deputies, is £750,000. Of this amount 10 per cent. is to be in cash and the balance in 4 per cent. bonds with a 1 per cent. sinking fund guaranteed by the Government.

Rolling Stock for New York Exhibition.—On January 16 the French National Railways shipped to the New York Exhibition one of its latest 100-seater 21-ton pneumatic-tyred Michelin railcars, which is to be one of the main exhibits in the French pavilion. Michelin pneumatic-tyred railcars have now covered an aggregate of about 20,000,000 miles on French and other overseas lines. The Coronation Scot train left Southampton yesterday (January 26) on the *Belpamela*. The loading is illustrated on page 141.

Road Accidents.—The Ministry of Transport return for December of persons killed or injured in road accidents is as below. The figures in brackets are those for the corresponding period of 1937 :—

	Killed	Injured
England—		
Pedestrians	337 (277)	6,144 (5,684)
Others	262 (252)	10,703 (10,835)
Wales—		
Pedestrians	12 (21)	285 (222)
Others	11 (5)	386 (326)
Scotland—		
Pedestrians	36 (30)	734 (603)
Others	24 (9)	855 (730)
	682 (594)	19,107 (18,400)

The total fatalities for the preceding month were 613, compared with 557 in the corresponding period of 1937.

Indian Train Wrecking.—The Bihar Government has announced a reward of £1,875 for information leading to the arrest and conviction of those responsible for the derailment of the Howrah-Dehra Dun express, on January 12, as reported in these columns last week. Twenty-one persons are now stated to have been killed and about 50 injured in this derailment, which occurred between the stations of Chichaki and Hazaribaoh, on the Grand Chord Line, about 210 miles from Calcutta. The East Indian Railway Company, on whose line the accident occurred, offered a reward of £375 for the detection of those responsible, states a Reuters message from Patna.

Noel Park Station.—The L.N.E.R. announces that after the reconstruction of the platforms, waiting rooms, and staircase at Noel Park station, improvements are to be effected to the booking hall and station frontage.

Foreign Visitors Inspect German Railways.—As many as 1,740 visitors from 41 different countries paid visits of inspection to the German railways during the past year. Altogether 27 of such travel groups took part in these trips during 1938, studying the technical equipment.

Deficit on Spanish Government Railways.—A Decree dated December 30 and published in the Barcelona *Official Gazette* of January 5, provides for a supplementary credit of 89 million pesetas, to cover the deficit accrued in the working of the railways operated by the National Railway Council in the territories under the control of the Republican Government.

Institution of Railway Signal Engineers.—At a meeting in London on January 25, a paper was read by Mr. J. E. Candler on "Optical Systems for Light Signals," which he illustrated by lantern slides and a selection of lamps, glasses, signals, and scientific measuring apparatus. In the discussion the following spoke : Messrs. L. H. Peter, H. H. Dyer, A. F. Syer, J. H. Fraser, J. Boot, and the President, Mr. G. H. Crook. The annual general meeting will be held in London on February 22.

Brick Traffic Exceptional Rate.—The Railway Rates Tribunal on Tuesday, reserved its decision in the application by the L.N.E.R. Company for sanction of an exceptional rate of 8s. 6d. a ton for about 15,000 tons of bricks from the London Brick Company's works at Fletton, near Peterborough, to Halifax, in Yorkshire. The standard rate is 14s. 8d. a ton. The application was opposed by the Northern Brick Federation. Hearing of the application occupied four days, January 17, 18, 23, and 24.

Cordoba Central Stocks.—In a circular to stockholders the board of the Cordoba Central Railway Co. Ltd. explains the proposed capital scheme, which will be submitted to meetings of the different classes of stockholders on February 9. Holdings of the £8,000,000 of 4½ per cent. first debenture stock are to be retained with nominal value unaltered. Interest arrears to October 1, 1938, are to be waived and the interest rate reduced to 3½ per cent. Ranking behind this stock will be £1,849,780 of "B" debenture stock, which will be allocated approximately as follows : To holders of £6,163,447 5 per cent. income debenture stock, an amount equivalent to 25 per cent. of their holdings in lieu thereof ... £1,540,862 ; to holders of £6,178,355 consolidated income stock, an amount equivalent to 5 per cent. of their holdings in lieu thereof ... £308,918. The directors estimate that a distribution of from 3 to 4 per cent. may be made on the new "B" debenture stock.

Canadian National Bonds Redemption.—The outstanding bonds, amounting to £500,000, of the Grand Trunk Pacific Branch Lines Company's 4 per cent. first mortgage sterling loan, guaranteed by the Province of Alberta, due February 25, 1939, will be redeemed on or after that date in London at the office of the Bank of Montreal.

Summer Time, 1939.—The date of introduction and period of operation of summer time in Great Britain, France, Belgium, and Luxembourg during 1939 will synchronise and will be from the night of April 15-16 to October 17. Consequently there will be no interim period during which the Continental services will leave or arrive in London one hour earlier. As there is no summer time in Germany, the introduction of summer time in the countries mentioned involve the customary adjustments in timings of through services on April 16.

Institute of Transport Annual Dinner.—The next annual dinner will be held on Friday, March 3, at the Connaught Rooms, Great Queen Street, London, W.C.2, and will be followed by a dance. The provisional programme which has been arranged is as follows : Reception by the President, 7 to 7.20 p.m. ; dinner, 7.30 p.m. ; dancing until 1 a.m. Tickets (price 18s. each, exclusive of wines, but inclusive of waiters' gratuities and buffet refreshments during the dance) are to be obtained from the Secretary of the institute. It is particularly requested that applications for tickets should be made as early as possible but not later than February 20.

Snow Dislocates Transport Services.—January 25 witnessed a return to the semi-arctic weather conditions of Christmas. All transport services were affected ; of the railways the G.N. Section suburban lines of the L.N.E.R. appear to have been the worst sufferers. Telegraph lines down and signals out of order added to the difficulties of traffic working on this section and delays of up to two hours occurred. On the Southern Railway, the weather was responsible for the death of the driver of the 7.30 a.m. Exeter to Waterloo. Snow covered his window, and in leaning out of his cab to see the signals, his head struck a bridge.

New Belgian Tourist Attractions.—Reductions amounting to 35 per cent. on all railway fares within Belgium, cheap petrol, 40 per cent. off visa charges, and half-price entrance to State museums are among the attractions offered to tourists by the latest Belgian bid to increase the number of her visitors. Special tourist cards will be issued this year through the travel agencies, and on production of these appreciable advantages can be gained

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by visitors. Similar reductions are offered in the entrance charges to the principal beauty spots, like the Grottes of Han, in the Ardennes, and special rates are to be quoted by Sabena, the Belgian equivalent of Imperial Airways. This effort is expected to help the Liége International Exhibition of Water and Waterways Hydraulics, which will be inaugurated this year to celebrate the opening of the last section of the Albert Canal, states a Reuters message from Brussels.

Regulation of All Forms of U.S.A. Transport

On January 13, Mr. Lea, Chairman of the House of Representatives Interstate Commerce Committee, introduced a General Transport Bill to aid the railways and bring all interstate freight rates under the jurisdiction of the Interstate Commerce Commission. The principal objects of the Bill, according to a Reuters message, are as follow:—

To reorganise the Interstate Commerce Commission, and broaden its jurisdiction so as to include such agencies as oil pipelines and airlines.

To permit of different rates for related carriers and authorise the Reconstruction Finance Corporation to make equipment and other loans, subject to the approval of the Interstate Commerce Commission.

To allow the railways, rather than the Interstate Commerce Commission, to initiate proposals for consolidations, mergers, or purchase of facilities.

To create a special reorganisation court, establish a special administrator to encourage railroad economies, and enlarge the membership of the I.C.C. from 11 to 14.

To extend the Interstate Commerce Commission's jurisdiction to include regulation of rates of all common carriers on water, rail, and highway and in the air.

To provide an appeal board to review orders of the rate-making division of the I.C.C., which, *inter alia*, is empowered to prescribe minimum rates for all transport agencies.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 3rd Week			Totals to Date		
	1939	1938	Inc. or Dec.	1939	1938	Inc. or Dec.
L.M.S.R. (6,831¼ mls.)	£	£	£	£	£	£
Passenger-train traffic...	377,000	386,000	– 9,000	1,111,000	1,148,000	– 37,000
Merchandise, &c. ...	418,000	485,000	– 67,000	1,164,000	1,414,000	– 250,000
Coal and coke ...	317,000	321,000	– 4,000	918,000	949,000	– 31,000
Goods-train traffic ...	735,000	806,000	– 71,000	2,082,000	2,363,000	– 281,000
Total receipts	1,112,000	1,192,000	– 80,000	3,193,000	3,511,000	– 318,000
L.N.E.R. (6,315 mls.)						
Passenger-train traffic...	253,000	259,000	– 6,000	750,000	776,000	– 26,000
Merchandise, &c. ...	293,000	335,000	– 42,000	785,000	966,000	– 181,000
Coal and coke ...	269,000	302,000	– 33,000	773,000	844,000	– 71,000
Goods-train traffic ...	562,000	637,000	– 75,000	1,558,000	1,810,000	– 252,000
Total receipts	815,000	896,000	– 81,000	2,308,000	2,586,000	– 278,000
G.W.R. (3,737 mls.)						
Passenger-train traffic...	169,000	162,000	+ 7,000	500,000	496,000	+ 4,000
Merchandise, &c. ...	178,000	198,000	– 20,000	512,000	583,000	– 71,000
Coal and coke ...	118,000	135,000	– 17,000	354,000	396,000	– 42,000
Goods-train traffic ...	296,000	333,000	– 37,000	866,000	979,000	– 113,000
Total receipts	465,000	495,000	– 30,000	1,366,000	1,475,000	– 109,000
S.R. (2,140 mls.)						
Passenger-train traffic...	260,000	263,000	– 3,000	782,000	790,000	– 8,000
Merchandise, &c. ...	55,000	60,000	– 5,000	154,500	170,000	– 15,500
Coal and coke ...	41,000	41,000	—	108,500	112,000	– 3,500
Goods-train traffic ...	96,000	101,000	– 5,000	263,000	282,000	– 19,000
Total receipts	356,000	364,000	– 8,000	1,045,000	1,072,000	– 27,000
Liverpool Overhead ... (6½ mls.)	1,440	1,411	+ 29	4,296	4,253	+ 43
Mersey (4½ mls.) ...	4,550	4,475	+ 75	14,054	13,934	+ 120
*London Passenger Transport Board ...	576,000	559,900	+ 16,100	17,049,100	16,859,700	+ 189,400
IRELAND.						
Belfast & C.D. pass. (80 mls.)	1,744	1,690	+ 54	5,079	5,035	+ 44
,, ,, goods	408	370	+ 38	1,043	1,085	– 42
,, ,, total	2,152	2,060	+ 92	6,122	6,120	+ 2
Great Northern pass. (543 mls.)	7,700	7,650	+ 50	24,750	24,700	+ 50
,, ,, goods	9,250	8,550	+ 700	24,600	23,350	+ 1,250
,, ,, total	16,950	16,200	+ 750	49,350	48,050	+ 1,300
Great Southern pass. (2,076 mls.)	26,649	26,239	+ 410	85,374	85,047	+ 327
,, ,, goods	41,347	39,166	+ 2,181	122,472	137,480	– 15,008
,, ,, total	67,996	65,405	+ 2,591	207,846	222,527	– 14,681

* 30th Week (before pooling)

British and Irish Railway Stocks and Shares

Stocks	Highest 1938	Lowest 1938	Prices Jan. 25, 1939	Rise / Fall
G.W.R.				
Cons. Ord. ...	65¼	25¾	23	– 2
5% Con. Prefce....	118¾	74	74½	– 6
5% Red.Pref.(1950)	111¾	90	90½	– 2
4% Deb.	111	97½	96½	– 1
4½% Deb.... ...	112 5/16	100½	100½	– 2
4½% Deb.... ...	118½	104	106	– 2½
5% Deb.	131½	119	117½	– 1
2½% Deb.... ...	69¾	60	63½	—
5% Rt. Charge ...	129	114	112½	– 2
5% Cons. Guar. ...	128½	103	106½	– 3
L.M.S.R.				
Ord.	30½	11	10¾	– ½
4% Prefce. (1923)	70¼	23	21½	– 3½
4% Prefce. ...	82¼	43¾	39½	– 5½
5% Red.Pref.(1955)	103½	66	62½	– 5
4% Deb.	105 15/16	85	90½	– 4
5% Red.Deb.(1952)	114¼	105	106	—
4% Guar. ...	102¾	77½	76 2	– 4
L.N.E.R.				
5% Pref. Ord. ...	8 9/16	3½	3½	– ¼
Def. Ord.	4 7/16	2 1/16	2	– ¼
4% First Prefce.	68¼	21	20½	– 3
4% Second Prefce.	27¼	8	9	– 1
5% Red.Pref.(1955)	97	40¼	40½	– 4
4% First Guar. ...	97½	66¼	64½*	– 6
4% Second Guar.	91¾	52	51½*	– 7
3% Deb.	79¼	60	62½	– 6
4% Deb.	104⅛	77	86	– 3½
5% Red.Deb.(1947)	110⅝	97	104½	—
4½% Sinking Fund Red. Deb.	108 11/16	101	103	+ ½
SOUTHERN				
Pref. Ord. ...	87	47⅞	51	– 5
Def. Ord. ...	21¾	9¼	10¾	– ½
5% Pref.	115	83	83½	– 7
5% Red.Pref.(1964)	115½	98	96½	– 4
5% Guar. Prefce.	128½	106	107½	– 6
5% Red.Guar.Pref. (1957)	116	109½	108½	– 3
4% Deb.	109¼	95	94½	– 3
5% Deb.	129	117	117½	—
4% Red. Deb. 1962–67	107	101½	100	– 1
BELFAST & C.D.				
Ord.	4	3½	4	—
FORTH BRIDGE				
4% Deb.	102	99⅛	96½	—
4% Guar. ...	103¼	94½	95	—
G. NORTHERN (IRELAND)				
Ord.	5½	2½	3¼	– ¼
G. SOUTHERN (IRELAND)				
Ord.	25½	8½	15	—
Prefce.	35	13	13	—
Guar.	70¼	30 15/32	30	—
Deb.	83	56	55	—
L.P.T.B.				
4½% "A" ...	119⅝	107½	108½	– 2
5% "A" ...	130	117	114½	– 4
4½% "T.F.A." ...	108	98	102½	—
5% "B" ...	122 13/16	105	112½	– 3
"C"	84	68	71	– 3
MERSEY				
Ord.	24¼	16½	20½	+ ½
4% Perp. Deb. ...	102⅞	94¾	94½	—
3% Perp. Deb. ...	77	69	66½	—
3% Perp. Prefce.	66½	57	55	—

* ex dividend

OFFICIAL NOTICES

Bengal-Nagpur Railway Co. Ltd.

THE Directors are prepared to receive Tenders for :—

136 Pairs ROLLED DISC CENTRED WHEELS WITH STEEL AXLES.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after 20th January, 1939.

A fee of 10s. will be charged for each copy of the Specification, which is *NOT* returnable.

Tenders must be submitted not later than Noon on Friday, 3rd February, 1939.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
T. R. WYNNE,
Managing Director.

THE Proprietors of Patent No. 440,987, for "Double-Seat Valve for High Pressure and High Temperature in particular for Controlling Steam Locomotives," are desirous of entering into arrangements by way of licence and otherwise, on reasonable terms, for the purpose of exploiting the same and ensuring its full development and practical working in this country. Address all communications in first instance to: HASELTINE LAKE & Co., 28, Southampton Buildings, Chancery Lane, London, W.C.2.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Universal Directory of Railway Officials and Railway Year Book

44th Annual Edition, 1938-39

This unique publication gives the names of all the principal railway officers throughout the world, together with essential particulars of the systems with which they are connected. Much general and statistical information about railways is also concisely presented.

Price 20/- net.

THE DIRECTORY PUBLISHING CO. LTD., 33, Tothill Street, Westminster, S.W.1.

CONTRACTS AND TENDERS

Cravens Railway Carriage & Wagon Co. Ltd. has received an order from the Crown Agents for the Colonies for four bogie inspection saloons for service on the Nigerian Railway.

Alcock, Ashdown & Co. Ltd. has received orders from the Indian Stores Department for the supply of 100 sets of crossings and 98 sets of switches.

The Hunslet Engine Co. Ltd. has received an order from the Anglo-Iranian Oil Co. Ltd. for four diesel-mechanical locomotives, each to be powered by a 106-b.h.p. National engine, and to be fitted with a Vulcan-Sinclair fluid coupling, Hunslet patent mechanical transmission, and completely flameproof equipment. The same builder has over 30 Hunslet-Hudson diesel locomotives of 20 to 50-b.h.p. in hand for various customers.

The Crown Agents for the Colonies have recently placed the following orders :—

General Electric Co. Ltd.: Automatic exchange equipment.
Babcock & Wilcox Limited: Boiler plant.
Guest, Keen & Nettlefolds Limited: Bolts and nuts.
Crompton-Parkinson Limited: Ceiling fans.
I.C.I. Metals Limited: Copper ingots.
J. Summers & Sons Limited: Corrugated sheets and ridging.
Dorman Long & Co. Ltd.: Corrugated steel sheets.
John I. Thornycroft & Co. Ltd.: Diesel launch.
Guest, Keen & Nettlefolds Limited: Dog-spikes.
National Gas & Oil Engine Co. Ltd.: Engine spares.
Mather & Platt Limited: Feed pumps.
Wolverhampton Corrugated Iron Co. Ltd.: Galvanised steel sheets.
Vernon & Co. Ltd.: Gauze.
R. Garrett Engineering Works Limited: Gowthorpe track recorders.
S. Smith & Sons (Notts) Limited: Gunmetal wire.
Ferguson Pailin Limited: Low and high-tension switchgear.
P. & W. Maclellan Limited: M.S. bars and plates.
Stewarts and Lloyds Limited: M.S. pipes and flanges.
Vacuum Oil Co. Ltd.: Axle oil.
Bayliss Jones & Bayliss Limited: P.W. bolts.
Aiton & Co. Ltd.: Pipework.
Steel Co. of Scotland Ltd.: Plates.
Kitchen & Wade Limited: Radial drilling boring and tapping machine.
Monks, Hall & Co. Ltd.: Rivets.

The Bombay Baroda & Central India Railway Administration has placed the following contracts, to the inspection of Messrs. Rendel, Palmer & Tritton :—

J. T. Inglis & Co. Ltd.: 300 chemically-dressed wagon covers.
James McIlwraith & Co. Ltd.: 176 chemically-dressed wagon covers.
Barrow Haematite Steel Co. Ltd.: 770 tons of pig iron.

S.A. Ateliers & Metallurgique Belge has received an order from the Chinese Engineering & Mining Company, through the Brussels office of Charles Ley, for 50 standard-gauge 40-ton bogie wagons for the Kailan Mining Administration, to be supplied to the inspection of Messrs. Sandberg.

The Pennsylvania Railroad has placed orders with the following firms for rolling stock for its through east-west expresses :—

Edward G. Budd Manufacturing Company, Philadelphia: five dining cars and 12 coaches, all fabricated of stainless steel by the Shotweld process.

Pullman Standard Car Manufacturing Company, Chicago: five dining cars with aluminium alloy bodies.

American Car & Foundry Company: five dining cars of high tensile steel construction.

Frederick Smith & Co. Ltd. has received an order from the Chinese Government Purchasing Commission, on behalf of the Ministry of Communications and to the inspection of Messrs. Fox & Mayo, for the supply of 100 metric tons of smoked hard-drawn copper wire.

The South Indian Railway Administration has placed the following orders to the inspection of Messrs. Robert White & Partners :—

Usines & Acieries Leonard Giot: 350 cast steel axleboxes.
Superheater Co. Ltd.: 578 superheater element ends.
Glasgow Railway Engineering Co. Ltd.: 24 pairs rolled steel disc wheels for 5-ft. 6-in. gauge, and 92 pairs for metre-gauge carriages and wagons.

The Bombay, Baroda & Central India Railway is calling for tenders, receivable by February 17, for the supply of helical and volute springs, and of spring steel.

Enquiries for British Locomotives and Wagons for Turkey

The Turkish Ministry of Public Works, Ankara, has invited tenders for the supply by British firms, in connection with the Anglo-Turkish Guarantee Agreement of May 27, 1938, of 42 Class "1E" 2-10-0 locomotives (similar to those described and illustrated in our issue of January 28, 1938, pages 175-177); and of 210 wagons for mineral traffic.

Tenders are invited by the Bengal-Nagpur Railway Administration receivable by February 3 at 132, Gresham House, Old Broad Street, London, E.C.2, for the supply of 136 pairs of rolled disc-centred wheels with steel axles.

Exports of Railway Material from the United Kingdom in December

	Dec., 1938	Dec., 1937	Twelve Months Ending Dec., 1938	Twelve Months Ending Dec., 1937
	£	£	£	£
Locomotives, rail	221,953	228,688	1,714,815	1,130,637
Carriages and wagons	145,418	217,079	2,966,524	2,791,260
Rails, steel	96,423	163,799	1,182,948	1,453,073
Wheels, sleepers, fishplates and miscellaneous materials	171,556	175,806	2,139,848	1,417,815

Locomotive and rail exports included the following :—

	Locomotives Dec., 1938	Locomotives Dec., 1937	Rails Dec., 1938	Rails Dec., 1937
	£	£	£	£
Argentina	7,092	5,329	2,252	8,599
Union of South Africa	—*	—*	22,599	33,896
British India	25,591	23,848	4,655	12,139

* Figures not available

Railway Share Market

The absence of indications of an early easing of tension in the international political situation has governed the trend in the stock and share markets, and lower prices have ruled. Selling pressure was, however, not heavy, but very little demand was in evidence, and consequently there was again a tendency for only moderate liquidation to result in a sharp decline in prices of individual stocks and shares.

In the circumstances it is hardly surprising that the downward movement in home railway securities has not been checked. Sentiment failed to benefit from rather more hopeful views in regard to the impending dividend announcements, based on the suggestion made in some quarters of the market that the results may show that in the latter half of 1938 the main line railways effected larger economies in many directions than has been generally expected. The further decline in debenture stocks was due partly to the trend in Government stocks and fixed interest-bearing securities generally, but it is realised that in most cases apparently attractive yields are offered and that there seem good grounds for anticipating that the debenture and guaranteed stocks would participate in any general market rally. As regards the junior stocks, prices may continue to move erratically pending the dividend statements next month.

After improving from 23 to 23½ Great Western ordinary declined sharply to 22¾ on Wednesday when the traffic returns and the surrounding conditions on the Stock Exchange caused a further general downward movement in railway securities. Great Western 5 per cent. preference is now 76 and the 4 per cent. debenture 96½. At one time Southern preferred came in for attention in response to slightly more hopeful dividend estimates, but later the price moved down to 52, while the deferred stock was 10⅝, the 5 per cent. preference 86½, the 5 per cent. guaranteed 109 and the 4 per cent. debentures 95. Although the Southern would not benefit to the same extent as the other main line railways if the major "Square Deal" claims were granted, the company may, of course, derive a good deal of benefit from the proposed increase of fares in the London area. L.M.S.R. ordinary was 10¾, the 1923 preference 22, and the 4 per cent. preference 41½, while the 4 per cent. debentures were lower at 91½. L.N.E.R. 3 per cent. debentures declined to 64 and the 4 per cent. debentures to 86½, while the 4 per cent. second guaranteed had a weak appearance at 53. London Transport "C" stock moved down to 71.

Argentine railway securities remained very inactive and were again lower, although little selling was reported. In view of the hopeful views as to the traffic outlook, there seems little doubt that the stocks of the B.A. Great Southern and other leading Argentine companies would move in sympathy with any general and sustained improvement in conditions on the Stock Exchange. Cordoba Central first debentures attracted some attention, there being buyers reported on any decline in price. American railway shares declined heavily as a result of the weakness shown by Wall Street markets.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1938-39	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1938	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1938	Prices: Lowest 1938	Prices: Jan. 25, 1939	Yield (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	22.1.39	11,840	— 5,530	3	34,760	55,340	— 20,580	Ord. Stk.	14	7¼	7½	Nil
	Argentine North Eastern	753	21.1.39	7,674	— 713	30	297,878	285,945	+ 11,933	,,	6½	2	5½	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	A. Deb.	82	75	72½	5½
	Bolivar	174	Dec., 1938	2,050	— 1,850	52	42,150	59,550	— 17,400	6 p.c. Deb.	8	7	8½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	10	4	5	9 5/16
	Buenos Ayres & Pacific	2,806	21.1.39	106,576	+ 7,134	30	2,290,885	2,416,008	— 125,123	Ord. Stk.	6½	3¼	4	Nil
	Buenos Ayres Central	190	7.1.39	$80,800	— $23,500	28	$3,128,700	$3,526,100	— $397,400	Mt. Deb.	15½	8	14	Nil
	Buenos Ayres Gt. Southern	5,082	21.1.39	186,476	— 29,715	30	3,893,424	4,012,034	— 118,610	Ord. Stk.	17 5/16	8½	10	Nil
	Buenos Ayres Western	1,930	21.1.39	52,543	+ 1,737	30	1,249,193	1,366,378	— 117,185	,,	12¾	5	7	Nil
	Central Argentine	3,700	21.1.39	134,957	+ 14,206	30	3,236,117	3,787,309	— 551,192	,,	13¼	5¾	7½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	6	2½	3½	Nil
	Cent. Uruguay of M. Video	972	14.1.39	16,992	— 2,337	29	517,633	490,783	+ 26,850	Ord. Stk.	3	1¼	1¾	Nil
	Cordoba Central	1,218	—	—	—	—	—	—	—	Ord. Inc.	3¾	¾	2	Nil
	Costa Rica	188	Nov., 1938	17,764	— 4,572	22	112,640	123,362	— 10,722	Stk.	28	22½	21½	9 5/16
	Dorada	70	Dec., 1938	15,200	— 1,900	52	193,300	187,200	+ 6,100	1 Mt. Db.	105¼	104	103½	5 3/16
	Entre Rios	810	21.1.39	17,624	— 924	30	470,959	426,634	+ 44,325	Ord. Stk.	7¼	3½	5	Nil
	Great Western of Brazil	1,092	21.1.39	12,400	+ 1,800	3	36,100	31,000	+ 5,100	Ord. Sh.	3/-	1/-	¼	Nil
	International of Cl. Amer.	794	Nov., 1938	$500,436	+ $56,587	48	$5,081,216	$5,224,782	— $143,566	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	6d.	6d.	½	Nil
	La Guaira & Caracas	22¾	Dec., 1938	800	— 4,090	52	57,905	61,575	— 3,670	Stk.	8	6½	7½	Nil
	Leopoldina	1,918	21.1.39	22,145	+ 2,557	3	70,413	56,950	+ 13,463	Ord.Stk.	4	1	1½	Nil
	Mexican	483	14.1.39	$268,800	+ $16,600	2	$514,600	$466,300	+ $48,300	,,	¼	1/16	⅛	Nil
	Midland of Uruguay	319	Dec., 1938	10,372	+ 210	26	53,944	52,725	+ 1,219	,,	⅞	½	½	Nil
	Nitrate	386	15.1.39	38'9	— 2,957	2	3,819	6,776	— 2,957	Ord. Sh.	52/9	19/16	15¼	5 13/16
	Paraguay Central	274	21.1.39	$2,827,000	+ $141,000	30	$91,003,000	$95,633,000	— $4,630,000	Pr. Li. Stk.	60	55½	55½	5 7/16
	Peruvian Corporation	1,059	Dec., 1938	68,780	— 8,128	26	409,453	504,036	— 94,583	Pref.	5¾	1¾	2	Nil
	Salvador	100	14.1.39	£32,750	— £5,000	29	£464,714	£455,125	+ £9,589	Pr. Li. Db.	23	20	19½	Nil
	San Paulo	153¼	15.1.39	29,479	— 1,287	2	56,730	59,086	— 2,356	Ord. Stk.	64	28	25½	15 11/16
	Taltal	160	Dec., 1938	3,400	— 2,785	26	16,915	22,535	— 5,620	Ord. Sh.	15/16	½	½	10
	United of Havana	1,353	21.1.39	20,524	— 2,276	30	473,143	505,506	— 32,363	Ord. Stk.	3⅝	½	1	Nil
	Uruguay Northern	73	Dec., 1938	1,224	+ 185	26	6,428	5,348	+ 1,080	Deb. Stk.	2	1	2	Nil
Canada	Canadian National	23,721	14.1.39	623,000	+ 9,517	2	1,184,452	1,157,436	+ 27,016	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	72	60	71½	5 9/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104	90	98½	4 1/16
	Canadian Pacific	17,186	14.1.39	425,200	— 47,000	2	850,400	929,800	— 79,400	Ord. Stk.	87/16	4¼	5½	Nil
India†	Assam Bengal	1,329	31.12.38	47,985	+ 4,249	39	1,119,766	1,033,248	+ 86,518	Ord. Stk.	81½	70	74½	4
	Barsi Light	202	31.12.38	4,177	— 1,763	39	106,200	100,328	+ 5,872	Ord. Sh.	60½	54¼	57½	6 15/16
	Bengal & North Western	2,108	31.12.38	89,459	+ 2,903	13	687,846	692,811	— 4,965	Ord. Stk.	311	278	273	6 9/16
	Bengal Dooars & Extension	161	10.1.39	3,015	— 766	41	119,164	117,179	+ 1,985	,,	89	83	88½	7 5/16
	Bengal-Nagpur	3,268	31.12.38	218,175	— 8,745	39	5,133,295	5,219,783	— 86,488	,,	95½	90	93½	4¼
	Bombay, Baroda & Cl. India	3,085	20.1.39	262,275	— 1,950	43	6,978,750	7,065,225	— 86,475	,,	112 7/16	95	107½	5 9/16
	Madras & Southern Mahratta	2,967	31.12.38	201,600	+ 8,380	39	4,155,271	3,932,225	+ 223,046	,,	109	97	101½	7⅜
	Rohilkund & Kumaon	571	31.12.38	17,580	+ 421	13	123,895	120,687	+ 3,028	,,	308	285	278	6½
	South Indian	2,531¾	31.12.38	124,675	— 18,628	39	3,084,162	3,137,554	— 53,392	,,	104	101	102½	4⅞
Various	Beira-Umtali	204	Nov., 1938	86,540	— 4,097	9	164,305	186,351	— 22,046	—	—	—	—	—
	Egyptian Delta	620	31.12.38	7,815	+ 346	39	172,193	182,314	— 10,121	Prf. Sh.	⅞	5/6	1½	Nil
	Kenya & Uganda	1,625	Dec., 1938	255,468	+ 59,041	52	2,656,111	2,715,524	— 59,413	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	49	41	43½	9 5 6
	Midland of W. Australia	277	Nov., 1938	14,024	— 431	22	75,880	69,130	+ 6,750	Inc. Deb.	9 3¾	89	95	4 5/16
	Nigerian	1,900	10.12.38	76,295	+ 6,176	37	1,258,931	1,884,489	— 625,558	—	—	—	—	—
	Rhodesia	2,442	Nov., 1938	392,385	— 35,849	9	779,368	895,597	— 116,229	—	—	—	—	—
	South Africa	13,285	7.1.39	562,227	— 44,526	40	25,117,360	26,072,527	— 955,167	—	—	—	—	—
	Victoria	4,774	Oct., 1938	828,129	+ 18,054	18	3,064,925	2,960,281	+ 104,644	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16
† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend
The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being over estimated. The statements are based on the current rates of exchange and not on the par value